Manufacturers Record

Reg. U. S. Patent Office

DECEMBER 1932 — 25 CENTS A COPY

MAR 11 1933

SOUTHERN POWER

The total primary power capacity of the South, including public utility fuel and hydro-electric generated energy, is 20,000,000 horsepower, showing a gain in the past 50 years of 3200 per cent. During this period the annual value of manufactured products of the South increased from $622,000,000 to more than $11,850,000,000, or over 1800 per cent.

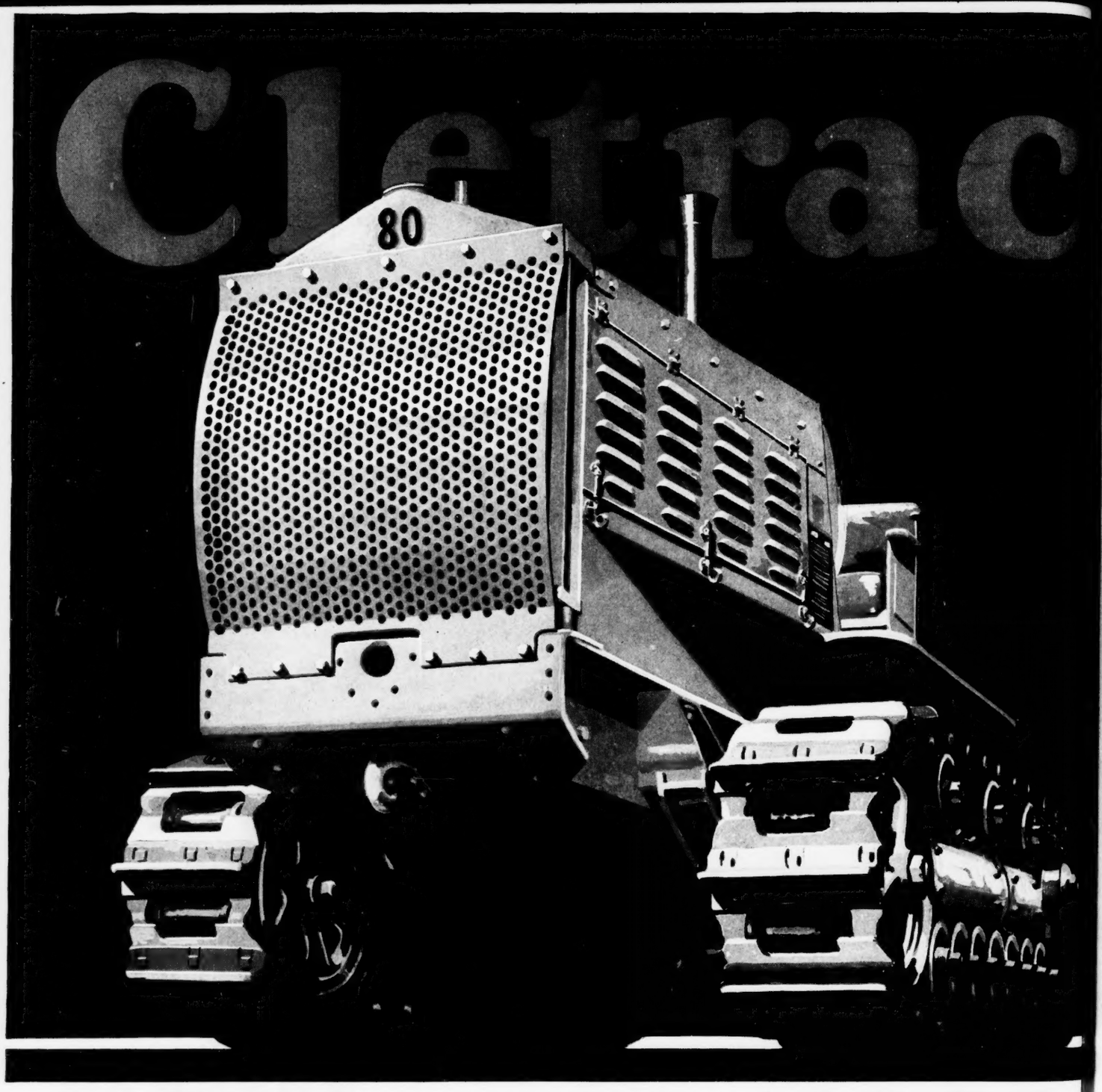
The installed power in Southern manufacturing in 1880 was less than 600,000 horsepower, and there were no public utility power plants in existence. According to the last Census, the power generating capacity of Southern manufacturing plants was 4,173,000 horsepower, and in addition 4,496,000 horsepower was developed by electric motors driven by purchased current. The record by decades is as follows:

SOUTHERN MANUFACTURING

Census	Installed Power (Horsepower)	Products (Value)
1879	554,824	$622,000,000
1889	992,062	1,242,000,000
1899	1,910,929	1,564,000,000
1909	4,029,599	3,158,000,000
1919	5,776,171	9,805,000,000
1929	8,669,941	11,853,000,000

The generating capacity of Southern public utility power plants is over 11,400,000 horsepower, which, added to the installed power plants of individual manufacturers, makes the total primary power capacity of Southern industry approximately 20,000,000 horsepower.

It has been the privilege and opportunity of the Manufacturers Record throughout the past 50 years to be a part of the vast upbuilding work of the Southern States. The South's achievement during this time is one with the record of the nation's advancement, in which power generation has so largely contributed to the industrial supremacy of the United States over the rest of the world.



NOW THE NEW IMPROVED CLETRAC 80 $4650

F. O. B. FACTORY

Complete with Electric Starting Equipment, Radiator Guard, Crankcase Guard and Front Pull Hook as illustrated

83 Horsepower at the Draw-bar

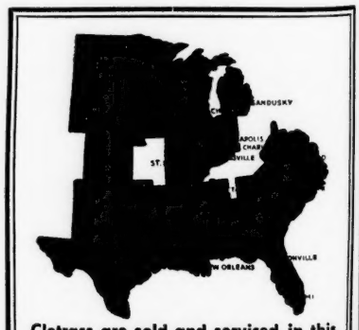
(New price equals 24½¢ per draw-bar pound pull)

THE AUSTIN-WESTERN ROAD MACHINERY CO.

FACTORIES AND HOME OFFICE—CHICAGO

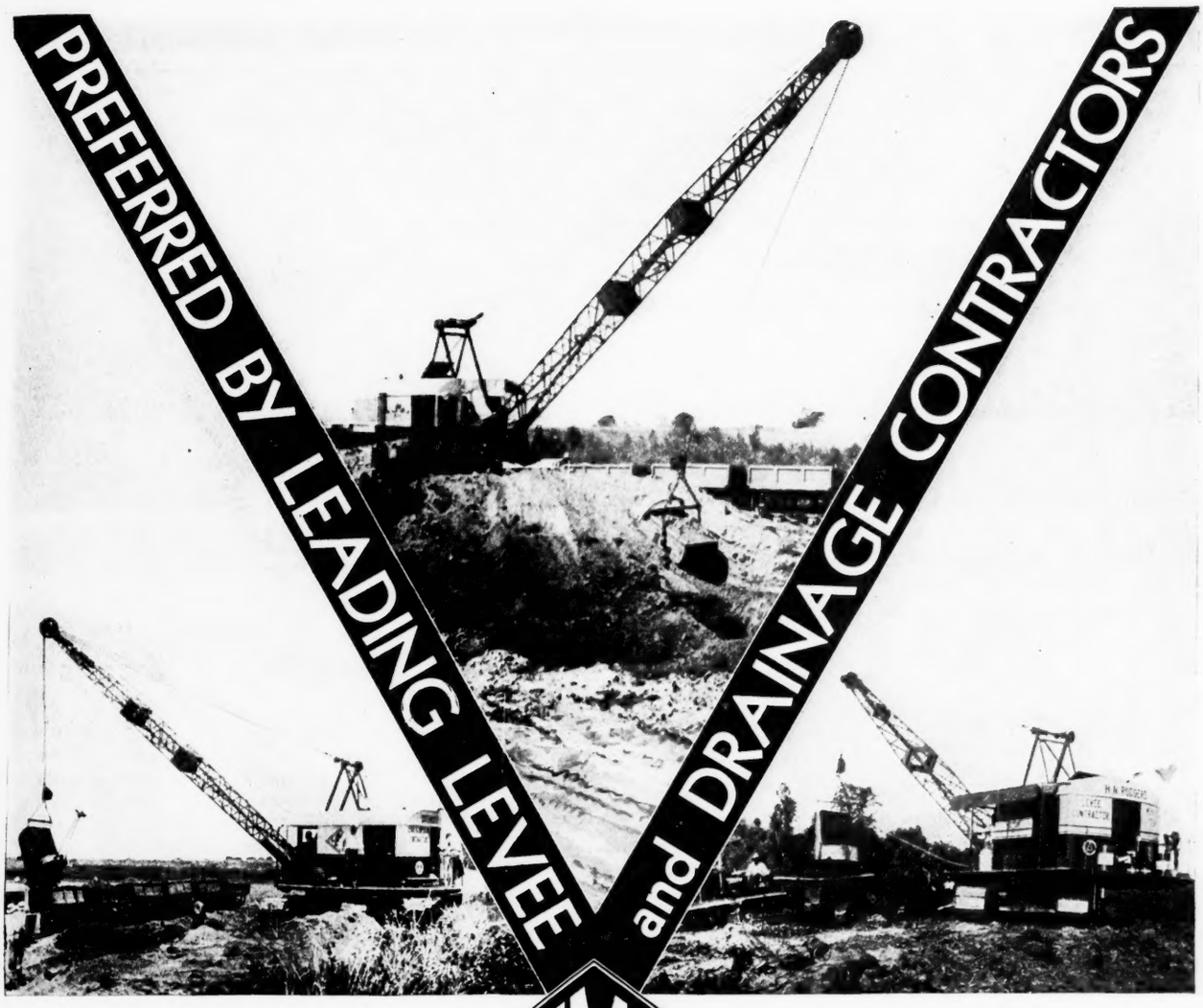
Branch Offices and Warehouses in Principal Cities

SEE THE CLETRAC 80 AT THE ROAD SHOW... DETROIT AIRPORT... JAN. 16—20



Cletracs are sold and serviced in this territory by The Austin-Western Road Machinery Co.

Entered as second-class matter at the postoffice, Baltimore, Md., under the act of March 3, 1879. Volume CI, No. 35, Monthly.



LIMA TYPE 601 DRAGLINE built To Produce High, Profitable Yardage

Levee contractors who are the most successful have always turned to excavators that offer the greatest yardage at least operating expense. This is the reason why levee and drainage contractors everywhere are turning to LIMA.

LIMA offers more practical and profitable features for dragline operation than any other make. Consider the drums. They are of extra large diameter—32 times the diameter of the cable, which means greater cable economy. Mobility, extra long crawlers with oversize treads, which afford extraordinary low bearing pressure. Roller bearings throughout. This feature cuts friction to a minimum. Helical gears throughout, for smoothness, quietness and long life. Synchro-power clutches, which relieve the operator of all extra effort of throwing the operating levers.

These are only a few of the features which have made the LIMA Type 601 so universally popular. Get the facts from our Bulletin DL 16-A. Write today for your copy.

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MEMPHIS 1201 Cotton Exchange Bldg.
Tyee Machinery Company, Ltd. Vancouver, B. C.

LIMA

101 · 106 · 302

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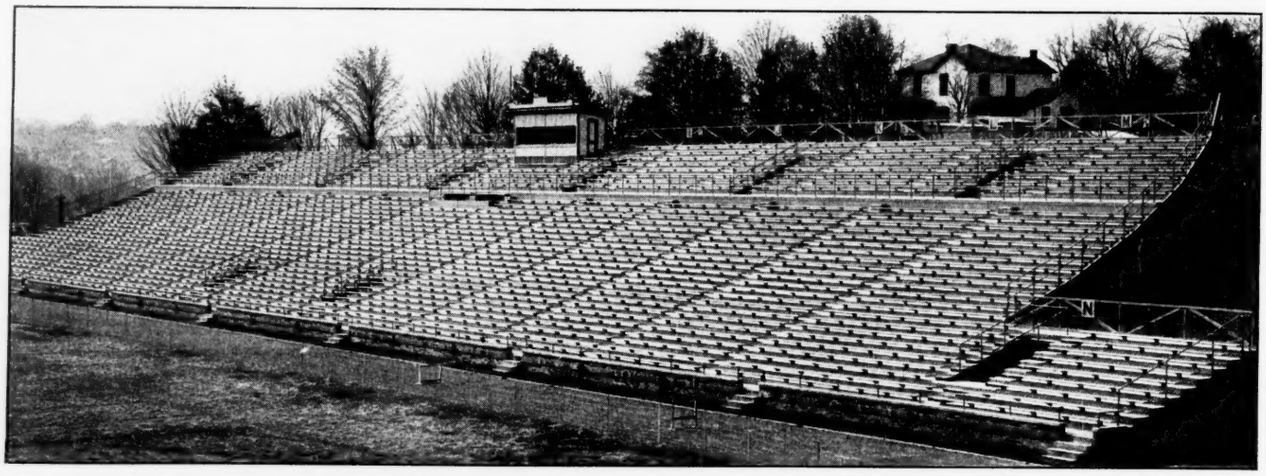

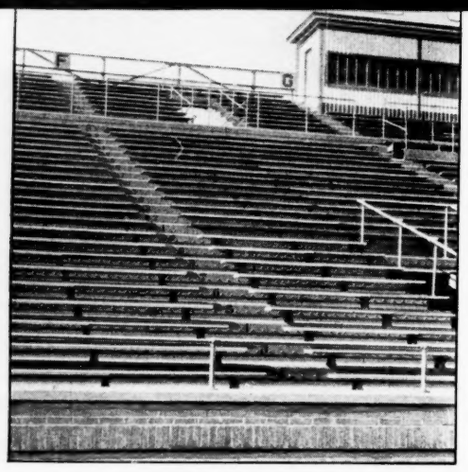

Seats, and More Seats

A few years ago we built a steel stadium for Washington and Lee University at Lexington, Virginia. Recently they had us enlarge this stadium to provide more seats for their football games. They have been highly pleased with what we have given them both as to design and cost.

Our steel stadium is a steel supporting frame with a steel deck, and then with raised wooden seats on steel brackets. It is a precise, economical and altogether durable design. Incidentally the seat and foot arrangement is the most comfortable that has ever been devised for outdoor stands.

We have built a number of steel stadia of different size and arrangement, some with more architectural treatment than others; some with a watertight deck and the space under it finished up for use as class rooms, dressing rooms, etc. Steel is always the most adaptable construction material, and its use in a stadium enables economies and facilities that cannot be had otherwise and withal a low first cost and low upkeep.

We shall be glad to furnish designs and estimates, or just talk it over, with no obligation whatever assumed or implied.

VIRGINIA BRIDGE & IRON CO.

Roanoke, Birmingham, Memphis, Atlanta, New Orleans
New York, Los Angeles, Charlotte, Dallas, El Paso

Plants at Roanoke—Birmingham—Memphis

VIRGINIA BRIDGE

Steel Structures

Here is a steel stadium, its deck and seating arrangement almost identical to the W & L Stadium above. But in this case the back and underpart has been utilized for 8 regular-size classrooms, an auditorium, armories, dressing rooms, showers, etc., at a considerable saving for combined facilities. We built this stadium for the Woodlawn High School, Birmingham, Ala.

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Steam Turbine Power Plant of the World's Largest Oil Refinery at Port Arthur, Tex.

MANUFACTURERS RECORD

Devoted to the Upbuilding of the Nation Through the Development of the South and Southwest as the Nation's Greatest Material Asset

Published Monthly

by the

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Frank Gould, President

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PUBLISHERS DAILY CONSTRUCTION BULLETIN AND BLUE BOOK OF SOUTHERN PROGRESS

Member, A.B.C.

Turn the Heavy Work Over to a TRACTRACTOR

POWERFUL
T-40
6-CYLINDER

TracTracTors are by far the most accessible crawler tractors on the market. This illustration of the 5-speed T-40 shows the rear cover plates through which the steering clutches and brakes are easily reached without disturbing the track, track frame, or driving sprocket. Transmission and other working parts equally accessible.

HERE is industrial power of high quality and new efficiency—the line of McCormick-Deering TracTracTors developed by International Harvester engineers out of an unequaled experience going back to the very beginning of tractor manufacture.

Investigate the record of the TracTracTors in highway building, levee projects, and construction programs of every type, and give them your own heavy work to do. You will be enthusiastic not only over their performance, but over their economy, which starts with first cost and continues with upkeep and maintenance savings.

TracTracTors are the product of the same manufacturing policy that has carried *International Trucks* to the front rank in sales and popularity—*and the same celebrated service serves them both.* Any International branch or McCormick-Deering industrial tractor distributor will give you further information. Or you may write us direct.

●TracTracTors are the latest and greatest of crawler tractors, built and backed by International Harvester, largest maker of tractors in the world.

FLEXIBLE
T-20
CAPABLE

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OF AMERICA
(*Incorporated*)
606 So. Michigan Ave. Chicago, Illinois

McCORMICK-DEERING

RESERVE STAMINA!

WATCH this rugged "Caterpillar" Tractor heave mightily against the bulldozer—and push the rock pile steadily aside. Such heavy-duty work is a tremendous test of strength and stamina—which "Caterpillar" engineers have anticipated! Ample weight is provided in the "Caterpillar" Tractor—to balance the power of the sturdy engine, and to match the positive traction of the broad, stout tracks. Over-sized parts of heat-toughened alloy steels are designed to resist the shocks and stresses imposed by the heaviest loads the "Caterpillar" Tractor can move!

"Caterpillar" track-type Tractors are built to take the toughest assignments. That's why so many dirt-movers and road-builders rely exclusively on "Caterpillar" performance!

Caterpillar Tractor Co., Peoria, Ill., U. S. A.

Track-type Tractors Combines Road Machinery

(There's a "Caterpillar" Dealer Near You)

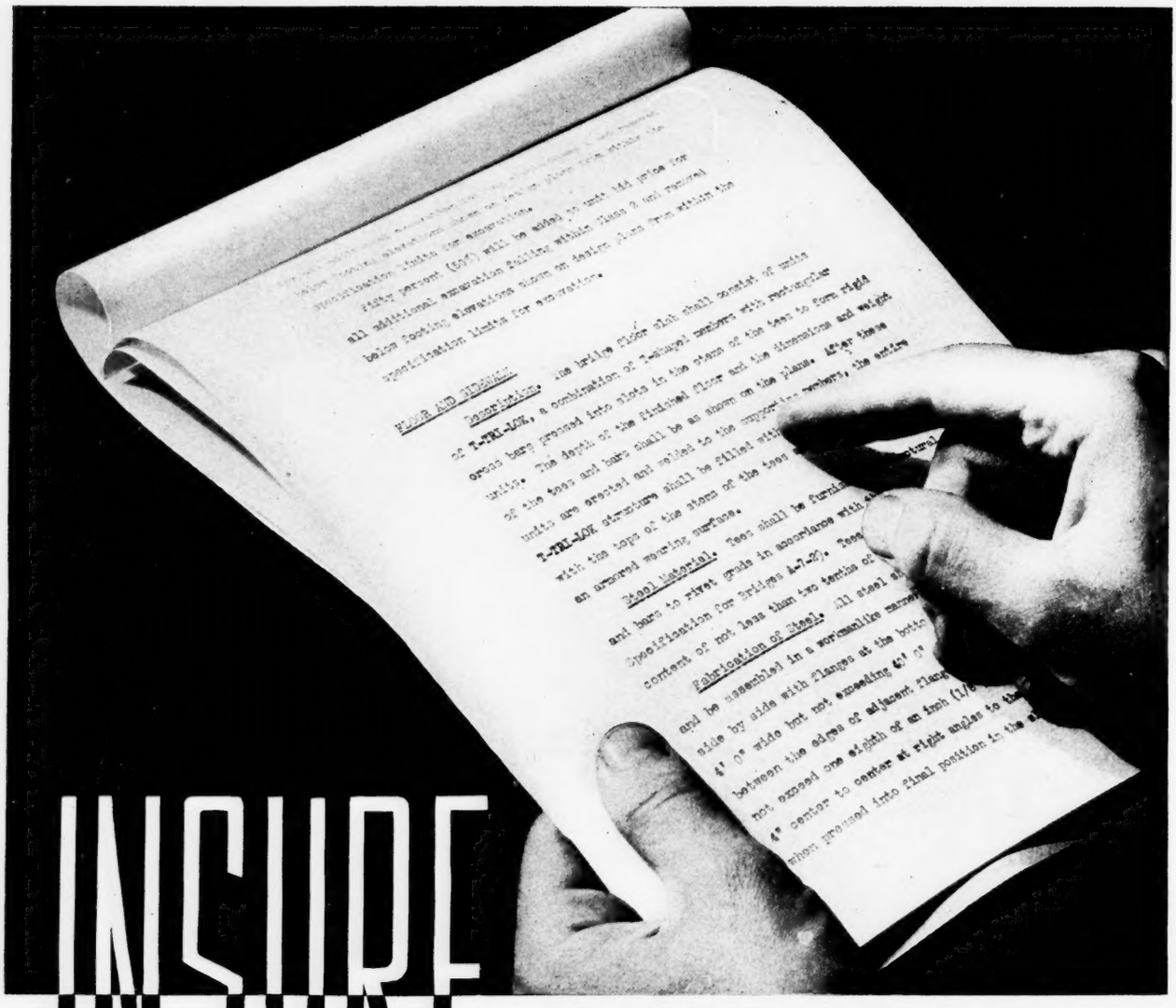
Prices—f. o. b. Peoria, Illinois

FIFTEEN	$1100	THIRTY-FIVE	$2400
TWENTY	$1450	FIFTY	$3675
TWENTY-FIVE	$1900	SIXTY-FIVE	$3850
DIESEL	$6500		

CATERPILLAR

REG. U. S. PAT. OFF.

TRACTOR



INSURE

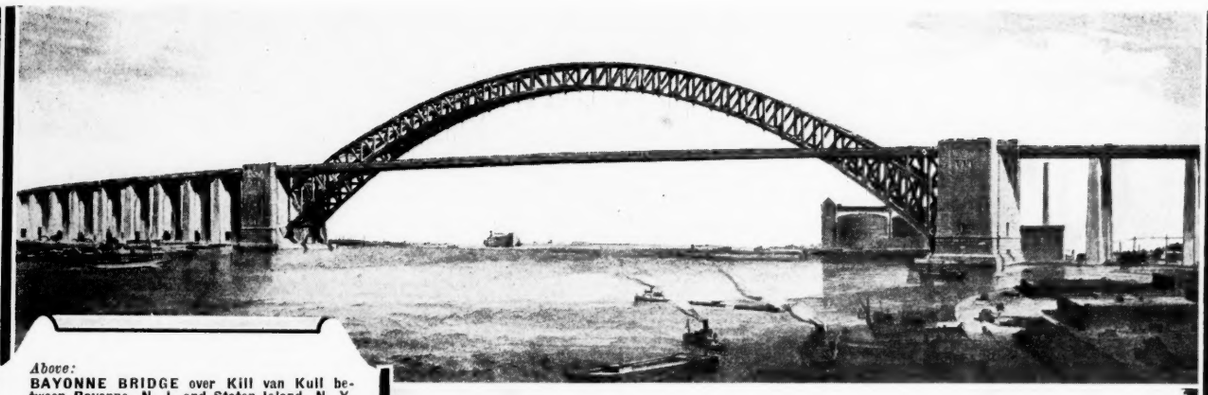
- Economical Construction
- Adequate Strength
- Rapid Completion
- Anti-Skid Surface
- Light Superstructure

203

BY SPECIFYING

T-TRI-LOK
BRIDGE FLOOR CONSTRUCTION

Product of Carnegie Steel Company, Pittsburgh, Pa., Subsidiary of United States Steel Corporation. Literature on request.



Above:
BAYONNE BRIDGE over Kill van Kull between Bayonne, N. J. and Staten Island, N. Y. (Class A Prize). Designed by O. H. Ammann, chief engineer for the Port of New York Authority.

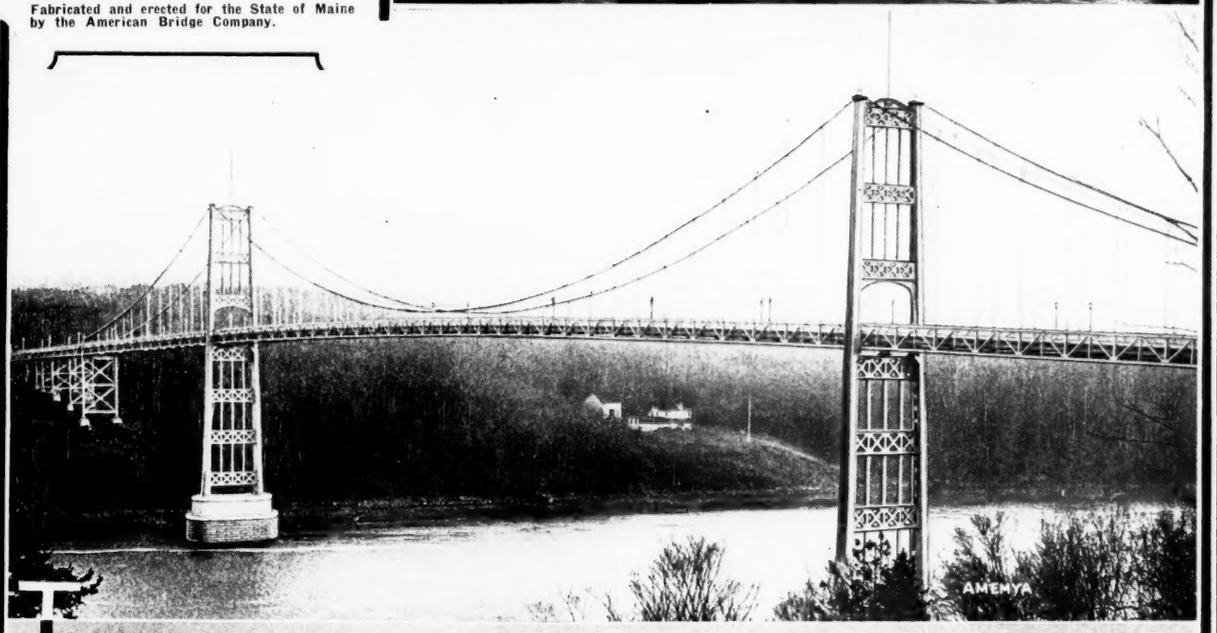
Fabricated and erected for the Port Authority by the American Bridge Company.

Center:
WEST STEWARTSTOWN BRIDGE over Connecticut River at West Stewartstown, N. H. (Class C Prize). Designed by engineers of New Hampshire State Highway Department.

Fabricated for the State of New Hampshire by the American Bridge Company.

Below:
WALDO-HANCOCK BRIDGE over Penobscot River at Bucksport, Me. (Class B Prize). Designed by Robinson & Steinmann, consulting engineers, New York City.

Fabricated and erected for the State of Maine by the American Bridge Company.



THREE AWARDS *for* BEAUTY, 1931

The three bridges here shown have been awarded respectively the Class A, Class B, and Class C prizes offered by the American Institute of Steel Construction for "the most beautiful bridge of steel" in each class, opened to traffic during the year 1931. The Class A prize is for bridges costing over $1,000,000, the Class B for bridges between $250,000 and $1,000,000, the Class C for bridges costing less than $250,000.

AMERICAN BRIDGE COMPANY

General Offices: Frick Building, Pittsburgh, Pa.

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

Contracting Offices: Baltimore, Boston, Chicago, Cincinnati, Cleveland, Denver, Detroit, Duluth, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Salt Lake City.

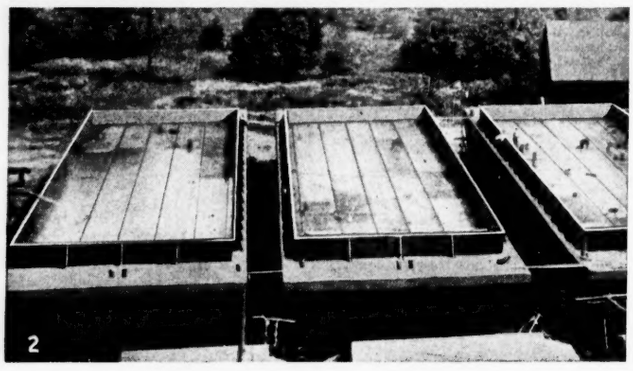
Pacific Coast Distributors: COLUMBIA STEEL COMPANY, San Francisco, Los Angeles, Portland, Seattle.
Export Distributors: UNITED STATES STEEL PRODUCTS COMPANY, New York, N. Y.

HOW LONG WILL IT LAST?

IN a cloud of spray and mist the new barge plunges from the ways to fulfill its destiny as a cargo carrier. How long will it last? The answer is simple—as long as its plates.

Therefore, be sure of the quality of your plates — and to do this, be sure of your source of supply.

The barge building industry is one of many which, through years of satisfactory experience, has developed a well-placed confidence in Tennessee Plates and in other Tennessee rolled products.



1. *Launching of an all-steel barge.*
2. *All-steel barges under construction. (These barges made of Tennessee steel.)*

Tennessee Coal, Iron & Railroad Co.
General Offices: Brown-Marx Bldg., Birmingham, Ala.
SUBSIDIARY OF UNITED STATES STEEL CORPORATION

TENNESSEE PLATES

WINDOWS *worthy* OF YOUR FINEST CREATIONS

IN designing any structure, whether home, office building, or public institution, you give a generous amount of careful consideration to its windows. Their spacing, location, shape and size are important factors in the beauty of the finished edifice. And equally important is the glass with which these windows are glazed.

Windows glazed with Pennvernon Glass are worthy of your finest creations. For Pennvernon is a window glass which approaches the polished perfection of plate glass more nearly than any other sheet glass.

The exclusive Pennvernon method of manufacture imparts to this glass three qualities which distinguish it from ordinary window glass. First, a brilliant, lustrous finish on both sides of the sheet that gives Pennvernon far greater beauty and reflection, and enables the glass to be glazed either side out. Second, a remarkable transparency and freedom from defects which guarantees clean-cut, undistorted vision. And third, a new denseness and smoothness of surface which results in better resistance to wear and abrasion, and consequently, in longer lasting beauty.

Make sure of windows worthy of the buildings you design. Specify Pennvernon Window Glass. It is available in single or double strength, and in thicknesses of 3/16" and 7/32", at the warehouses of the Pittsburgh Plate Glass Company in all principal cities, and through progressive glass jobbers and leading sash and door manufacturers. Write us for samples to examine. Pittsburgh Plate Glass Company, Grant Building, Pittsburgh, Penna.

PENNVERNON WINDOW GLASS

EARLE for all GEARS

Unretouched Photo of Earle Gears

Whatever your requirements, send us your specifications for an estimate. There's no obligation entailed.

EARLE GEARS

THE EARLE GEAR & MACHINE COMPANY

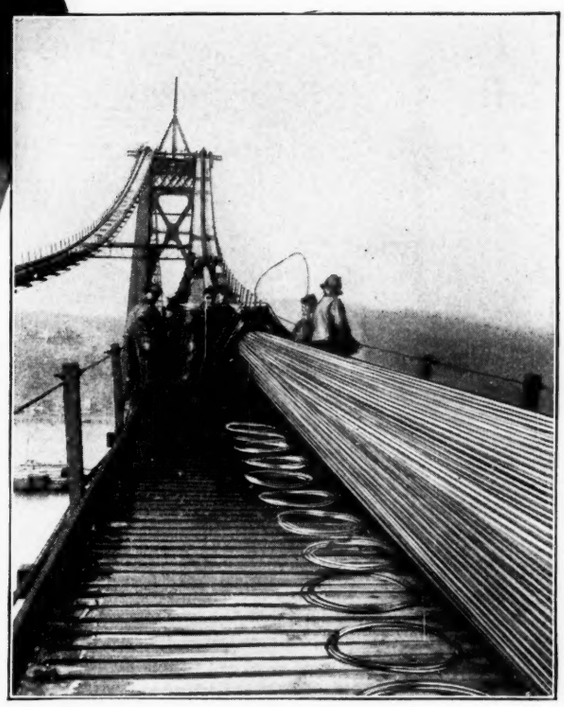
4719 Stenton Ave., Philadelphia, Pa.

NEW YORK PITTSBURGH BOSTON

WIRE MAKER TO THE NATION

FROM ONE SOURCE . . .

HAIRPIN WIRE
for milady's coiffure



. . . . to MIGHTY STRANDS OF STEEL

FROM *one* source—Wire for the myriad things made of Wire! Broom wire, Mattress wire, screw stock and wire rods—wire of any shape, any analysis, and in any quantity—drawn to the most exacting specifications. Here at wire headquarters every need is promptly served.

Here—also—you may obtain wire products applicable to many needs. Wire Rope, Welding Wire, Electrical Wires and Cables, Radio wires, Cold Rolled Strip Steel, and Springs of all kinds and sizes. All made to the high quality that has a nation-wide reputation for the utmost in dependability.

American QUALITY Steel & Wire Company

WIRE AND WIRE PRODUCTS

Supporting every claim for quality and service are facilities capable of almost unlimited production, and resources that permit of no compromise with reliability of result and real economy.

1831 MORE THAN 100 YEARS of PROGRESS IN WIRE MAKING 1932

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Hundreds of industrial plants located in territory supplied with NATURAL GAS have found that they can obtain their power requirements both economically and reliably by the use of

NATURAL GAS ENGINES

These power users range in size from the small grist mill or cotton gin to the large industrial plant.

The industries that have been operating for a number of months, report a saving in power costs of from twenty to seventy per cent over previous costs.

If you are a user of power, you should investigate NATURAL GAS ENGINES

NOW

For information apply to your local Natural Gas Company or to us.

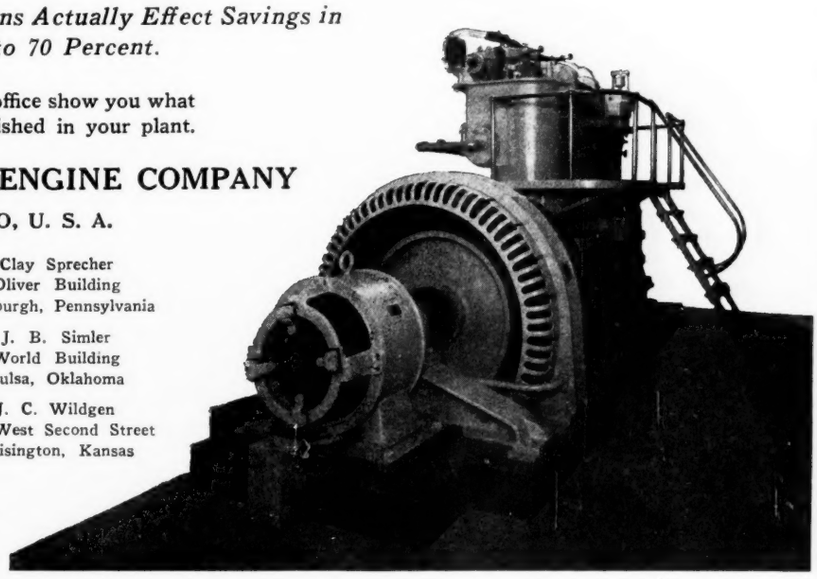
SOUTHERN NATURAL GAS CORP.
WATTS BUILDING
BIRMINGHAM, ALABAMA

Gas and the Gas Engine Reduce Power Cost

Gas has for years been recognized as the ideal fuel. Thousands of Bruce-Macbeth installations in Electric Generating Plants, Water Works, Oil Plants, Ice Plants, Flour and Cotton Seed Oil Mills, and factories of all kinds have thoroughly established the exceptional economy and reliability of Gas Power.

Bruce-Macbeth Installations Actually Effect Savings in Power Costs of from 30 to 70 Percent.

Let our nearest office show you what can be accomplished in your plant.



THE BRUCE-MACBETH ENGINE COMPANY

CLEVELAND, OHIO, U. S. A.

Smith Booth Usher Company
228 Central Avenue
Los Angeles, California

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Fort Worth National Bank Bldg.
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"BUILDERS OF HEAVY DUTY GAS ENGINES FOR OVER 30 YEARS"

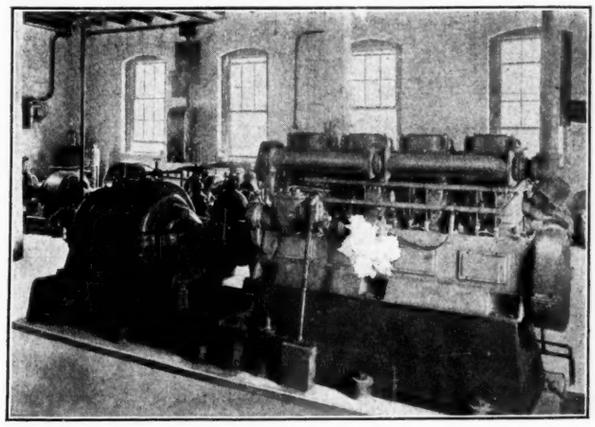
IN EVERY STATE OF THE U. S. A.
IN EVERY PROVINCE OF CANADA
TOTAL—

Over **1000** *Sterling Engines are serving reliably in emergency.*

Sterling High Duty

Internal Combustion Engines

12 to 565 B. H. P.
Gas or Gasoline



At Decatur, Ga., GRC-8 cylinder 240 H.P. Sterling engine driving a Dayton-Dowd 8" type CSD, 4 stage centrifugal pump, 1500 GPM, 350 ft. head, 1150 RPM.

Low initial cost, quick starting, powerful Sterling engines for direct connection have been specially developed for standby service.
Sterling has the engineering talent and always enjoys working out installations requiring special features—automatic starting if you wish.

STERLING ENGINE COMPANY

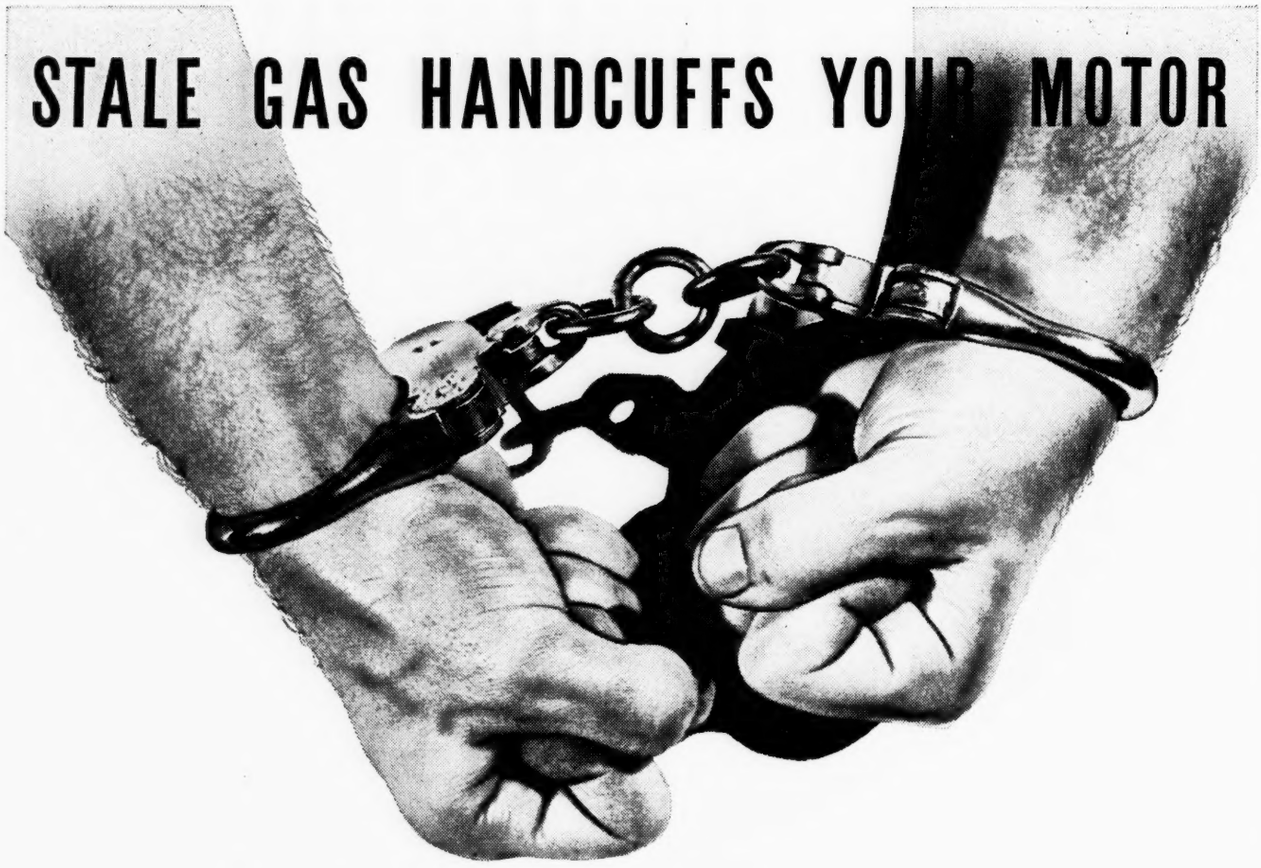
Home office and plant
1270 Niagara Street
Buffalo, N. Y.

Dept. C-7

Exhibiting at the Power Show, New York, Dec. 5-10.

Branch office
900 Chrysler Bldg.
New York, N. Y.

STALE GAS HANDCUFFS YOUR MOTOR



ONLY *fresh* GAS UNLEASHES FULL POWER

Staleness steals the power of gasoline. Little by little, the lighter parts—important "easy starting" elements—evaporate! Also a physical change takes place—so that, *as staleness increases, power decreases!*

And the staler the gas, the more it knocks—and the *stickier* it is—more apt to foul a motor.

The whole petroleum industry has long sought a way to stop gasoline deterioration. Now Gulf announces a system that assures every motorist of getting FRESH-MADE gasoline! How?

By making the best possible gasoline and *refining out* the elements (unsaturated hydrocarbons) that cause fast deterioration.

And by rushing this FRESH gas to you like some perishable food!

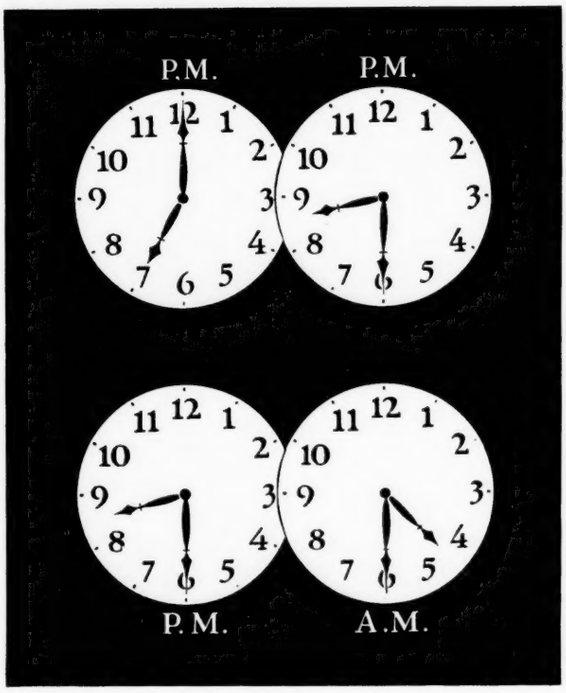
SPEED! The whole Gulf organization is geared to it. Huge Gulf refineries in many sections of the country put every Gulf filling station close to a source of FRESH gasoline. A vast fleet of tank trucks speed FRESH gas to Gulf pumps every day.

Get FULL power for your gasoline dollar. Get FRESH-MADE gas—delivered FRESH. Get Gulf exclusively—and you'll have a motor that's faster. A motor that's cleaner. And quieter.

get THAT GOOD GULF GASOLINE—*it's fresh*

Bargain Hours

for Long Distance Telephoning



on station-to-station calls

7:00 P. M. TO 8:30 P. M. THESE CALLS COST ABOUT 15% LESS

8:30 P. M. TO 4:30 A. M. THESE CALLS COST ABOUT 40% LESS

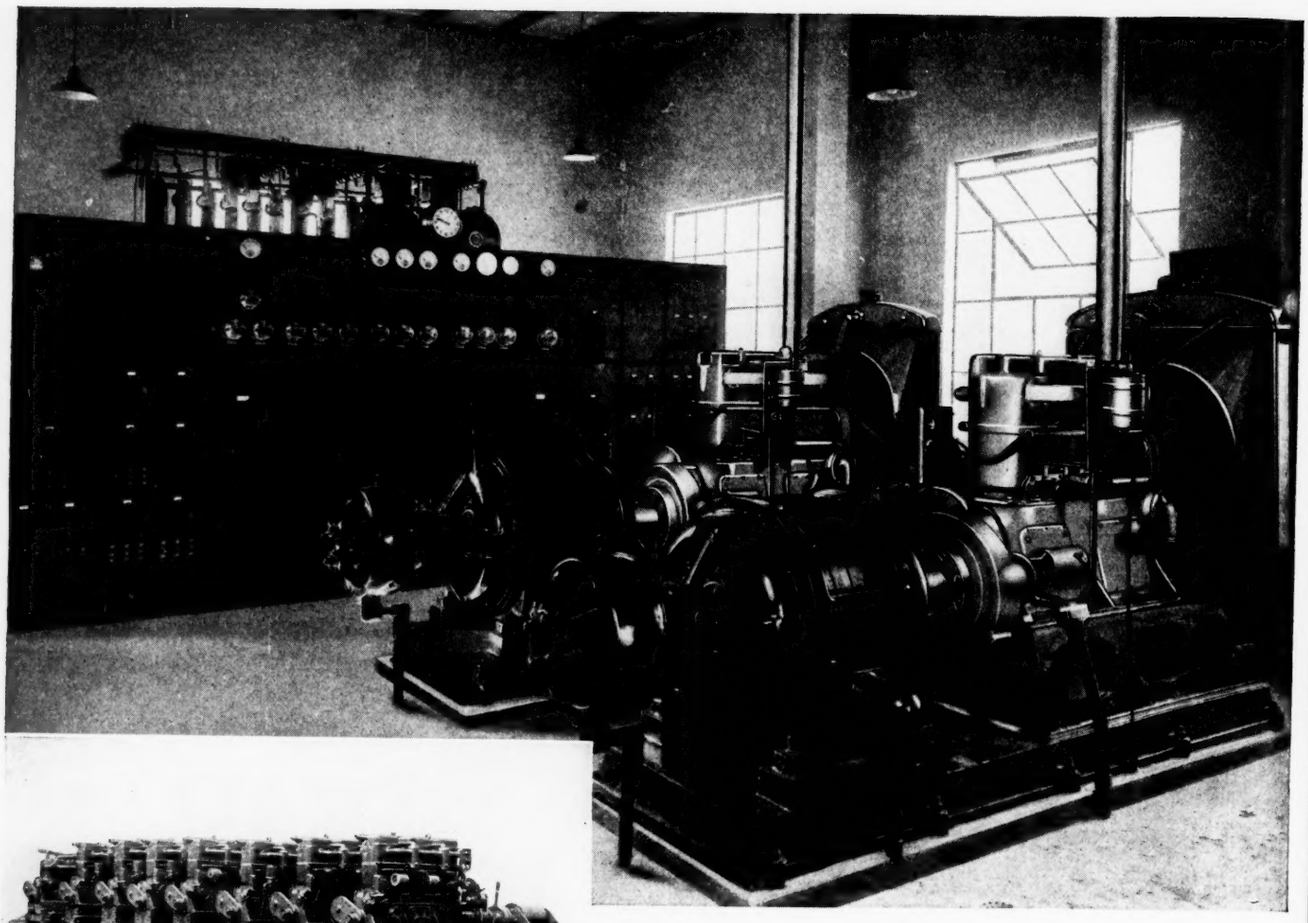
THESE are times of extraordinary values—but seldom do you enjoy any values greater than those offered you every day in the year by Long Distance.

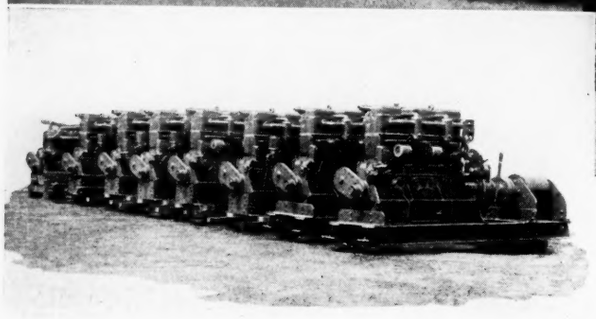
Rates for Long Distance calls are low. They have been reduced four times in recent years. During the evening and night hours, the rates for station-to-station calls—those on which you will talk with anyone who answers—are exceptionally low. Between 7:00 P.M. and 8:30 P.M. (evening period) the daytime station-to-station rates over 35 cents are reduced by 10 to 20%. Between 8:30 P.M. and 4:30 A.M. (night period) these rates are again reduced, becoming about 40% less than for daytime calls.

The bargain hours appeal particularly to those whose use of Long Distance is largely personal or social. Many women keep in close touch with out-of-town friends and relatives. Men, away on trips, telephone home each night. Mothers talk frequently with children away at school.

In addition to their regular use of Long Distance during the daytime, many business men take advantage of the bargain hours to transact important matters *by telephone* during the evening. Sales managers have their field men call in at convenient, specified times. Executives hold regular conversations with associates in other cities. Production chiefs get verbal reports from superintendents of distant factories.

You can talk across the state or across the country as clearly as you can across the street. Telephoning between cities is *quick . . . easy . . . inexpensive.*





Dressed up and going places!

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• Manufacturers Record •

EXPENSIVE GOVERNMENT

As pointed out in an article elsewhere in this issue, the government of the United States is at present actively engaged in more than 300 lines of industry and in direct competition with private citizens. This country cannot afford to allow these activities to be conducted in this way with our present economic system built as it is around individual initiative and the individual's rights to survive. The government of this country was not designed to fill economic functions and its organization does not lend itself to the efficient operation of any business undertaking.

We have had ample proof of what may be expected in waste and extravagance and inefficiency through past attempts with government-managed enterprises, and they continue to be present in practically every effort of this kind to which government sets its hand. The handling of the country's railroads during the war and the condition in which they were left in 1921 is a glaring example.

According to the testimony before the Shannon Committee, the Federal Barge Line on the Mississippi River has been operated since 1924 by the government, with an investment of public money amounting to $24,000,000. Its operation in each of the eight years of its life has failed to earn anything and during that time it has had to pay no taxes, nor any interest charges. On the contrary, $100,000,000 of additional taxpayers' money has been spent to provide a navigable right of way, for which, of course, the Federal Barge Line pays nothing. There is no incentive to make a profit in government business undertakings, and therefore efficient, economical management is not as important as it is in private business. There is, on the other hand, every opportunity for mis-management to serve political ends and for graft to satisfy the greed for easy money and greater power.

Whenever the government enters the field of business it does so necessarily at the expense of private enterprise already established in that field. Every shipment carried on the 300 and more watercraft in the Federal Barge Line fleet is taken away from the railroads and private carriers serving the same territory. Not only do these private carriers lose this revenue freight, but they are taxed by the Federal government to finance their competitor. Such a condition, typical of that which exists wherever the government competes with private enterprise, discourages concerns already established from further expansion and prevents the investment of private capital in new enterprises through lack of profitable opportunity.

It is a far cry indeed from the simple functions accorded to government by the founders of this nation to the complex bureaucratic form our government takes today—not only in competition with private enterprise to a glaring degree, but in regulatory control of almost every form of endeavor. In the Federal Government we have the nation's largest banker, and now a proposal from the American Federation of Labor for government pro-ration of work—all this while the country professes to prefer the advantages of a competitive economic system.

Obviously the further we expand the functions of government the greater the cost of its operation must be. At present one dollar out of every four in the gross earnings of the American people must be paid for taxes. Federal, State, county and municipal taxes for 1932 amount to more than the world's available gold supply. The activities of the Federal Government in business contribute materially to the rise in taxes not only because of the operating costs of the various enterprises involved, but also through the creation of new classes of political agencies for spending money.

Private industry loses on every side—through the loss of business as a result of unfair competition and through a double increase in taxes brought on by the necessity of financing the government-owned enterprise it competes with, and of carrying an additional burden imposed by the removal of taxable wealth by this self-same government undertaking.

A reduction in these operations of government, which it was not designed to perform, will serve two ends foremost in the mind of the American people today—a material reduction in the overwhelming expense of government and a stimulation of business activity. Public opinion must be brought to bear forcefully on Congress to begin the withdrawal of the Government from the fields of business at the earliest possible moment.

20,000,000 HORSEPOWER

THE installed primary power of the South's manufacturing and public utility power plants is approximately 20,000,000 horsepower. No other region of the United States is more favored by nature for creating mechanical energy. It has abundant water resources for hydro-electric development, great fuel producing areas including coal, lignite, gas and oil, and wood, all of which are being utilized in developing power for its factories, mines and electric transmission equipment.

The capacity of the South's power plants in individual industries and electric utilities, by types of generating equipment, is as follows:

Power Plant Capacity in South	Steam Plants (Horsepower)	Water Wheels and Turbines (Horsepower)	Internal Combustion Engines (Horsepower)
Public Utility	6,882,000	4,213,000	289,000
Manufacturing	3,687,000	163,000	322,000
Total	10,569,000	4,376,000	611,000

This tabulation shows that the South has 20 per cent of the steam power generating capacity of the country; 30 per cent of the water wheel and turbine generating capacity, and 36 per cent of the internal combustion engine generating capacity. Added to the installed power of Southern manufacturing plants are 4,496,000 horsepower developed by electric motors driven by current purchased from other manufacturers or public utilities, making the total installed primary power of Southern manufactures 8,669,000 horsepower as compared with 5,776,000 horsepower in 1919 and only 1,910,000 horsepower in 1900, indicating the tremendous power development of Southern manufacturing, in 30 years.

The extent of manufacturing in the South may be judged from the percentage of power developed as compared with the country's total which shows that over 23 per cent of the steam engine capacity; 18.5 per cent of the steam turbine; 26 per cent of the internal combustion engine; 10.4 per cent of the water wheel and turbine, and over 19 per cent of the country's electric motors driven by purchased current are in Southern manufacturing plants.

The electric generating capacity of public utility power plants in the South is now 11,400,000 horsepower, figured on the basis of 1.3406 horsepower for each kilowatt, as shown by the accompanying compilation from the last annual report of the Geological Survey.

Converted into electric energy, water power in Southern public utility plants amounts to 32 per cent of the country's total power capacity as generated; steam power 23 per cent and internal combustion engines represent 53 per cent of the power capacity of internal combustion engines installed in the country's public utility power plants.

Electric power production by public utilities in the South in 1931 was 19,912,000,000 kilowatt-hours, or 5.5 per cent less than the peak of 1929. In 1931 the South consumed in its public utility power plants about 5,000,000 tons of coal, 2,850,000 barrels of oil, and 72,150,000,000 cubic feet of gas which produced an aggregate of 11,745,000,000 kilowatt-hours or about 59 per cent of its electrical output in 1931 was generated by fuel-burning plants.

For the first nine months

Installed Primary Power, by Types, in Southern Manufacturing

(Developed Horsepower)

States	Steam Engines	Steam Turbines	Internal-Combustion Engines	Water Wheels and Water Turbines	Electric Motors Driven by Purchased Energy
Alabama	227,592	154,269	13,465	4,898	385,106
Arkansas	101,185	23,710	9,500	....	88,639
District of Columbia	7,476	3,807	569	1,520	31,544
Florida	71,813	22,121	10,732	....	88,029
Georgia	158,766	53,978	10,273	30,506	388,376
Kentucky	88,911	29,415	4,852	1,203	230,359
Louisiana	221,521	107,897	20,617	130	130,239
Maryland	95,225	118,795	79,797	3,775	362,231
Mississippi	135,688	47,634	12,941	....	56,317
Missouri	158,592	43,089	14,880	1,729	499,688
North Carolina	183,202	90,252	9,753	34,532	522,206
Oklahoma	48,673	39,380	27,934	....	107,270
South Carolina	134,969	61,888	2,065	35,096	293,308
Tennessee	161,281	89,993	8,832	3,995	342,603
Texas	191,134	127,113	59,990	690	443,933
Virginia	150,356	194,180	9,188	36,784	255,743
West Virginia	118,864	224,769	26,851	8,742	270,973
Total South	2,255,248	1,432,290	322,239	163,600	4,496,564
South's percentage of country's total	23.4	18.5	26.1	10.4	19.3

Electric Generating Capacity, by Types of Power, in Southern Public Utility Plants

States	Individual Types: Water Power Kilowatts	Individual Types: Steam Power Kilowatts	Individual Types: Internal Combustion Engines Kilowatts	Combination of Two or More Types: Water Power Kilowatts	Combination of Two or More Types: Steam Power Kilowatts	Combination of Two or More Types: Internal Combustion Engines Kilowatts
Alabama	635,050	245,475	4,201	200	240	.....
Arkansas	66,855	73,849	5,147	.....	1,294	2,310
District of Columbia	2,400	226,500	.....	.....	.....	.....
Florida	14,250	317,126	23,449	200	4,600	3,666
Georgia	287,702	130,554	1,835	3,780	3,500	200
Kentucky	104,860	236,017	1,005	315	975	850
Louisiana	.....	246,940	16,230	.....	2,712	1,550
Maryland	252,780	344,970	2,597	19,200	.....	60
Mississippi	.....	45,220	12,989	.....	697	1,324
Missouri	149,105	574,797	21,619	.....	1,810	3,415
North Carolina	642,140	337,695	4,239	6,126	2,000	1,275
Oklahoma	1,500	299,840	28,079	200	1,065	2,390
South Carolina	522,430	141,416	440	16,200	6,397	330
Tennessee	186,671	196,202	2,770	23,100	15,390	592
Texas	6,480	833,832	51,376	880	27,016	13,208
Virginia	82,044	295,764	4,378	14,053	65,790	668
West Virginia	55,970	504,210	4,200	135	62	195
Total South	3,010,237	5,050,407	184,554	84,389	133,548	32,033
South's percentage of country's total	32	23	53	30	22	31

of 1932, based on the monthly figures of public utility power plants issued by the Geological Survey, 13,560,000,000 kilowatt-hours of electricity were produced, or a decrease of 10.6 per cent compared with the corresponding period of 1931, and a decline of 11.4 per cent for the rest of the country. Electricity produced from fuels in the South for the first nine months of 1932 amounted to 6,872,000,000 kilowatt-hours or a 22 per cent decrease compared with the same period of last year, while the output of hydro-electric plants amounting to 6,688,000,000 kilowatt-hours showed a gain of 1 per cent over the first nine months of 1931. Notwithstanding the declines of 1931 and 1932, public utility power output of the South is running about 50 per cent above the production of 1925 and double that of 1921. On the whole the electric power industry of the South has shown a lower decrease in production during the depression than many other major industries of the country. It has extended its lines into rural communities and otherwise improved service to individual consumers which helped, in some measure, to take up the slack of the larger industrial users. Since 1930 several large additions were made to the South's public utility power generating capacity and many high-tension power lines were built into areas heretofore without electric service. Some of this expansion has taken place during the past year, details of which are given elsewhere in this issue.

TO GO FORWARD

INVESTMENT funds are accumulating and will soon press for an outlet through the channels of industry. Science and invention have been doing their part during the lull in other activity, with the result that, in the future, products with which we are more or less familiar will be made better and at lower cost, and new products will tempt us to buy.

The progress of this country in the past has been due to the constantly expanding outlook of our people. Their gaze has always been upward.

At present, industry is trying to find the answer to the question of what will induce buyers to come into the market. On the one side is the viewpoint that prices must come down materially, even if it means still lower wages, which it will, with constantly increasing difficulty in the payment of debt already incurred. The other viewpoint is that through improved processes and economy of operation, which the depression has taught us, a better product can be turned out with increased employment as a result, and in the maintenance of American standards we will see the advantage of buying the newer things, even if we have to scrap old equipment and take a loss for the moment that should later mean increased profit.

There would seem to be here an unquestioned reason for persistent and widespread advertising. It has been an unfortunate condition that manufacturers and producers, feeling the pinch of the times, have thought it necessary to curtail their advertising expenditures, for undoubtedly in this course there is the abandonment of probably the greatest motivating force that can be utilized in the restoration of confidence and the improvement of industrial conditions.

FACING CONGRESS

WHEN this is printed Congress will be in session with questions before it of supreme importance to this country and the world. These questions run the gamut from war debts to unemployment relief. European nations are asking for a re-examination of the debt question and their requests will probably be granted, even if the decision, finally, is against cancellation. It is frequently necessary, and especially in times of depression, to grant terms to debtors.

With an unbalanced budget it would seem impossible to avoid further and increasing taxation. A sad outlook for the country unless Congress courageously faces the task of cutting expenses to the bone. Unfortunately, in any consideration of this all-important topic and how it is to be met, we are faced with politics and the obligation politicians feel they have assumed in holding their jobs. It is a time for patriotism and not politics. The whole question of the excessive cost of government and a pyramid of taxation that is crushing our people should be gone into as any business man would in his own private affairs when he faces a situation of having to arrange his budget within his income if he expects to survive.

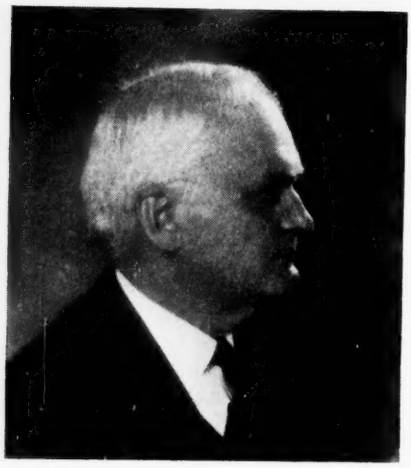
Congress will be confronted with increased demands on the part of the unemployed for a bonus bill or what in effect, if not actually, would be a dole. If it is a public duty of states, or municipalities or national government, and there is serious doubt that this is the function of government, to feed the hungry, certainly it is reasonable to expect that this shall be arranged in such a way as to provide some form of work for those who are able to work, whereby, as far as possible, some self-respect on the part of the individual may be maintained. Suggestions along this line run from a larger program of public works to the creation of camps or settlements under army direction to teach men discipline and order, and to keep them occupied. There is always the probability of mischief for idle hands.

It is obvious that the incoming administration faces a load of responsibility that is staggering. It should have the wholehearted cooperation of every individual, regardless of party, in every move making for the country's welfare. And that is today clearly the spirit of the people.

Congress at the same time has an opportunity no Congress for years has had, by reason of party control, to do constructive work of a kind that will lift the country from despondency to a condition of definite progress. On the other hand, the possibility of radical and unsound legislation is a danger which cannot be overlooked and one to which every right-thinking citizen must be continually alert and active to prevent.

VIRGINIA'S ECONOMY MEASURES

Reducing Debt Without Increasing Taxation



By

Jno. Garland Pollard
Governor of Virginia

VIRGINIA believes that the State should live within its income. Virginia is not increasing taxes. Virginia is reducing her debt. Virginia is reducing expenditures. Virginia is not neglecting essential development work.

As of the close of the fiscal year which ended June 30, 1932, the report of the Comptroller showed a surplus of $560,000 in the general fund of the State treasury. The total State expenditures for all purposes for that year amounted to $47,334,110, of which $11,099,804 was returned to the counties and cities for roads, schools and other purposes. The total State expenses for the year was $5,904,260 less than the total State expenditures for all purposes for the next preceding fiscal year which ended June 30, 1931. The total State revenues from all sources amounted to $3,467,490 less for the fiscal year which ended June 30, 1932, than for the next preceding fiscal year.

Appropriations amounting to $1,505,000 for certain capital outlays were made by the General Assembly of 1930 conditioned upon the certificate of the Governor that the expenditure thereof would not, in his opinion, result in a deficit at the close of the biennium ending June 30, 1932. No part of these conditional appropriations was released and a deficit was thus prevented.

Strict Adherence to Budget

When the General Assembly of 1932 convened last January for a session of 60 days, the heart of my message was expressed in these words: "Curtail expenses: Increase no taxes." This course was adopted by the General Assembly. Appropriations for the biennium beginning July 1, 1932, were made to conform substantially to the recommendations contained in the balanced Executive Budget submitted by me, and no general taxes were increased. In conformity with my recommendation, the General Assembly reduced by 10 per cent the compensation of State officers and employes for the fiscal year ending June 30, 1933. This reduction amounts approximately to $1,025,000. Legislation was also enacted decreasing by 10 per cent the compensation of many local officers and employes for the calendar year 1933.

Estimates of revenues submitted by the fiscal officers of the State for the biennium beginning July 1, 1932, were carefully made; but these estimates, on which the budget was based, were made under unprecedented conditions, and, in enacting the general appropriation act, a clause was inserted authorizing the Governor to reduce appropriations "pro rata when necessary to prevent an overdraft or deficit for the fiscal period for which such appropriations are made." The act further provides that "* * * the Governor is directed so to administer this act as to prevent any such overdraft or deficit" in the general fund of the State treasury.

Several weeks prior to July 1, 1932, it appeared to me, on the basis of reports received from the fiscal officers of the State, that the estimates of revenues on which the budget was based, would not be fully realized for the year beginning July 1, 1932, and to meet this condition and the further development that certain items of expenditure, notably criminal charges, were exceeding the estimates, I ordered for the year a 10 per cent cut in the total of each general fund appropriation, with the necessary exceptions, this 10 per cent cut being in addition to the 10 per cent salary cut already mentioned. This executive action will decrease expenditures by approximately $1,600,000. Further executive action will be taken from time to time to the extent necessary to prevent a deficit.

State Debt Decreased

Virginia is not increasing her debt but is decreasing it. As of October 1, 1915, the gross State debt amounted to $24,123,139. As of November 30, 1931, the gross State debt amounted to $22,983,078. The debt was $1,140,061 less in 1931 than it was in 1915. By far the greater part of this debt, namely, $17,555,078, was originally contracted before the War Between the States. The residue ($5,428,000) is the unpaid portion of highway certificates authorized in 1926 to cover advances made principally by counties and cities to anticipate the construction of the State Highway System. The sinking funds of the State as of November 30, 1931, aggregated $2,959,520 and the Literary Fund amounted to $6,311,505. The per capita net debt of Virginia was $11.26 in 1915 and $10.93 in 1930, or a decrease of 33 cents in the 15-year period, while the per capita net debt of all the States rose from $3.75 in 1915 to $15.02 in 1930. The most excellent standing of Virginia bonds is well known. Virginia is one of the very few States which have decreased their indebtedness since 1915.

State Tax System

The general property tax system is not in operation in Virginia. The Virginia tax system provides for the separation of the source of revenue, State and local. The State taxes intangible personal property at low rates for State purposes, but real estate and tangible personal property are segregated for local taxation exclusively. Only a small percentage of the State tax revenues is derived from the taxation of property.

In times of depression, taxes which are measured by income, gross receipts, or volume of business, or taxes which are based upon annual assessments of personal property, automatically reduce themselves in the sense that the taxpayer is called upon to pay less in taxes without any reduction in the rates. But it may be noted that Virginia has materially increased individual income tax *exemptions* since the depression began. This was done by an act of 1930. Real estate taxes, however, are generally extended on assessments made at fixed periods several years apart, and for this and other reasons, in times of falling prices real estate taxes in many localities can be effectually reduced only by reducing the rates.

No State Tax on Real Estate

Real estate in Virginia has not been taxed by the State for State purposes since the tax year 1926. Since that year, the political subdivisons of the

State have had the exclusive power to tax real estate for local revenue purposes, and in 1928 the voters of the State ratified an amendment to the Constitution of the State prohibiting the General Assembly from imposing any State tax on real estate for State purposes. Prior to 1927 the State imposed a State tax of 25 cents per $100 on real estate. This tax was repealed as of January 1, 1927.

Local Tax Relief Measure

The demand for local tax relief in Virginia has been largely met by an act of 1932 establishing, as of July 1, 1932, the Secondary System of State Highways for maintenance and construction by the State out of motor vehicle revenues, commonly known as the Byrd tax relief road plan; and so designated popularly because the plan was suggested in Virginia by the distinguished former Governor primarily as a local tax relief measure. The Secondary System of State Highways consists of all the public roads, causeways, bridges, landings and wharves in the several counties as of March 1, 1932, not included in the State Highway System. Although the act contained a provision that any county might, by a vote of the people, withdraw from the operation of the act, yet only 15 of the 100 counties voted on this question on August 9, 1932, the date fixed for the election, and of those 15 counties, only four voted themselves out of the system. The act repealed all local taxes in the counties for road construction and maintenance, except in those counties withdrawing, but none of the four counties withdrawing is imposing any such taxes in 1932. **On the basis of the 1931 figures, the annual local tax relief given taxpayers in the counties is $2,895,000, beginning in 1932. This tax relief represents an average reduction of 18.42 per cent in the total local tax burden in the counties. Real estate owners are the principal beneficiaries. The tax reduction is equivalent to an average rate of 38 cents per $100. It is perhaps the largest single tax reduction in the history of the State.** This plan also involves aid to cities for the construction and maintenance of streets constituting connecting links in the State Highway System. The plan calls for no increase in State taxes. The entire cost of constructing and maintaining highways in Virginia, whether parts of the primary or secondary system, is now put upon the motor vehicle in the form of license and gasoline taxes. No appropriations are made out of general tax revenues for highways.

The measures which have been taken to maintain the State's financial integrity are in general receiving the cooperation of State officials and employes. Decreases in compensation and in appropriations are being accepted generally without complaint, and every effort is being made to get a full dollar's worth of value for every dollar expended. The policy of curtailing expenses and increasing no taxes is meeting with the approval of the people of the State who see in this policy a wise solution of the problem confronting governments by reason of the decreases in the revenues.

Continues Development Program

In adjusting expenditures to reduced revenues Virginia has not sacrificed her pay-as-you-go program for the continued development of the State's resources.

Out of the surplus revenues which accumulated prior to the depression, the State wisely set aside in 1928 and 1930 about $6,500,000 for additions and betterments at State institutions, for the Shenandoah National Park and other development work. A substantial proportion of these funds was expended after the industrial collapse in 1929 and was of material advantage both in preventing unemployment as well as advancing in a substantial way the development of State institutions.

The receipts from special road taxes increased steadily from 1930 up to 1932, and for the current year show only a small decrease under the preceding fiscal year. With the addition of Federal aid allotments, these revenues enabled Virginia to increase her expenditures for the State highway system to $17,640,000 in 1930 and $20,191,000 in 1931, each year representing a new peak in outlays for roads. For the fiscal year beginning July 1, 1932, and ending June 30, 1933, these expenditures will amount to about $14,000,000. For the primary and secondary highway systems combined, our expenditures for the current fiscal year should approximate $20,000,000.

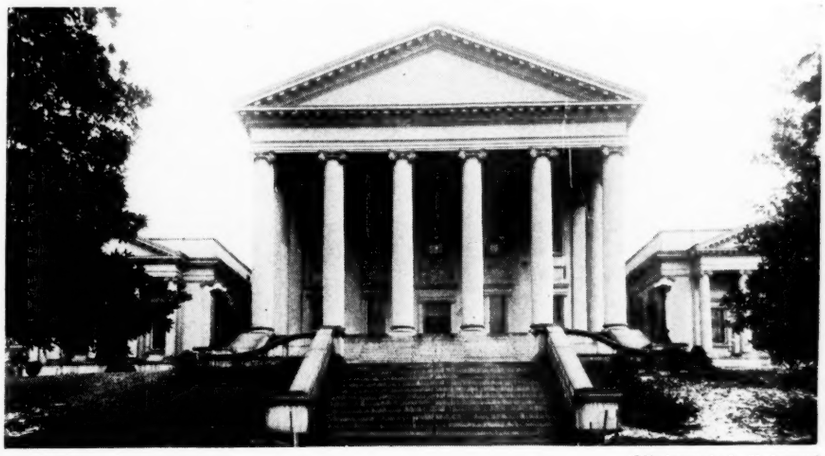
From January 1, 1930, to December 31, 1931, 600 miles of hard surfaced roads were added to the State highway system. In addition to other construction and maintenance, an extensive program for widening and straightening main highways was advanced rapidly.

For other development work the State has set aside for the current biennium approximately $750,000. Included in this amount is $175,000 for the completion of a Carillon as a Memorial to World War Veterans. This Memorial stands in a beautiful park in the City of Richmond and was recently completed at a total cost of about $350,000. Other capital outlay items include $360,000 for additions and betterments at State institutions, $100,000 toward the development of the Colonial National Monument connecting Yorktown, Williamsburg, and Jamestown, and $25,000 for the George Washington Memorial Parkway. The State Commission on Conservation and Development has been enabled to continue without serious curtailment its work of erecting historical markers, investigating geological and water power resources, topographic mapping, and advertising Virginia's historical and material advantages.

The development of the Shenandoah National Park on the crest of the Blue Ridge Mountains under the supervision of the Conservation Commission is progressing rapidly. The Federal Government has recently opened the upper portion of the scenic road, known as "Skyland Drive" which will extend from the Northern to the Southern entrance of this park, of which approximately 40 miles has been constructed. The volume of tourist traffic which the Park is attracting has already exceeded all estimates and it is apparent that additional road construction will be necessary to provide for this traffic.

The ability of the State to maintain its finances on a sound basis and, in addition, to continue the development of its economic resources during a period of abnormal depression is a forcible suggestion of the benefits which may be expected under a continuation of our present and fiscal administrative policies when the depression is replaced by a revival of business activity.

Virginia State Capitol at Richmond



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GOVERNMENT IN BUSINESS

By

Howard L. Clark

THE Federal Government is the biggest business in the United States. Aside from its Army and Navy operations, other branches for the conduct of normal executive and legislative business of the Government, and the billion dollar emergency credit activities ordinarily the function of banking institutions, it has gradually invaded the field of private production, merchandising, transportation, communication and service to the point where State Capitalism is a reality and not a theory.

Startling facts have been brought to light by the Special Congressional Committee to Investigate Government Competition With Private Business. Joseph B. Shannon, member of the House of Representatives from Missouri and chairman of the Special Committee, states these facts will be submitted in full detail in the Committee's report, together with evidence supporting them. And this evidence has been accumulating.

The rising tide of protest against government competition with private business is filling the office of the Chairman with thousands of pages of testimony and hundreds of letters citing direct injury to literally thousands of individual concerns in every part of the United States. Evidence gathered at the hearings which have been under way for about four months indicates that the Federal Government and not including State and local governments, is competing with private business in approximately 300 industrial lines. More than 25 nation-wide business organizations have been collecting information on the subject. Chambers of commerce in many cities have been actively assisting the Committee to gather the facts now available for study in more than 30 volumes, each averaging 250 typewritten pages. They present evidence that should awaken the nation to the harmful encroachment of government in business and the great need for remedial legislation.

Thousands of individual concerns are protesting against unfair government competition with private business. They object to being contributors as taxpayers to government owned and operated enterprises competing most hurtfully with their own business.

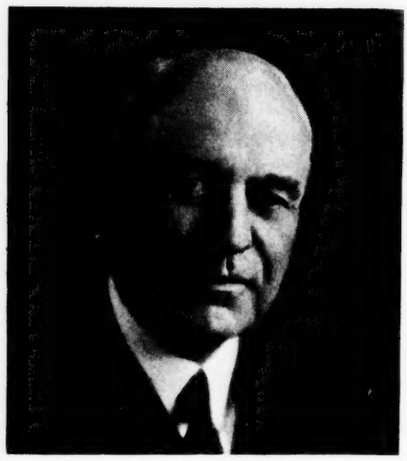
Among the 300 industries affected are:

Agriculture; railroads; water transport; express; architects; contractors; amusements; baking; banking; brick making; canning; brush, broom; textiles, cotton, wool, canvas, rope, cordage, bags, etc.; clothing; shoes; printing, binding; cement dealers; chemicals; coal; creamery; dairy farming; engraving; envelopes, stationery; explosives; fertilizer; food; furniture; furs; gasoline; tires; hotels, restaurants; ice manufacturing; grain trade; cotton trade; insurance; laundries; lumber; boxes; marine repairs; saddlery, harness; aluminum, bronze, monel and steel castings; paints, varnish; rubber products; awnings; atomizers; coils; Diesel engines; flags; sails; satchels; leather products, etc.

The complaints that have come before the committee extend from Porto Rico to Honolulu and from cities throughout the United States. "The widespread evil of government competition at a time when the American business man is having a hard struggle to keep his head above water and to preserve his means of livelihood," said Mr. Shannon in an address some weeks ago, is found in the foregoing list of affected industries many of which were included in an appeal for relief presented by the Federation of American Business with a membership representing 34 states and more than 160 industries. The Chamber of Commerce of the United States, the National Association of Manufacturers, and other organizations of nation-wide scope have been active in aiding the Committee to secure facts as to the extent of government competition.

It was brought out at the hearings of the Committee that money collected from the taxpayers of the nation, including railroads and private water transport, has been expended to the extent of $100,000,000 on Federal Barge Lines alone. It was asserted that the cost to the taxpayers has been more than the alleged saving of the Inland Waterway corporation to shippers individually, for if the railroads could operate as the Federal barge line operates the railroads could reduce rates 40 per cent as against a reduction of 20 per cent by the barge lines. The railroads could do this if they had to pay no taxes, no return on invested money and did not have to maintain their tracks.

From 1901 to date Government shipbuilding competition aggregated $253,000,000 of new construction and in addition Navy Yards did work for other branches of the government in excess of $80,000,000, or a total of $333,000,000 of work was taken away from private industry, according to H. G. Smith, president of the National Council of American Ship Builders. In doing this work the Government did not carry insurance on the vessels or fire insurance on buildings and equipment, did not carry a performance bond, and did not include in its cost of doing business depreciation, obsolescence and amortization charges that private industry must include. Also all Federal Government institutions have the franking privilege which saves an enormous amount in postage that private business must pay.



Joseph B. Shannon
Representative, 5th District Missouri, Chairman of the Special Congressional Committee to Investigate Government Competition With Private Business. Other Members of the House of Representatives Serving on This Special Committee Are E. E. Cox (Georgia), William H. Stafford (Wisconsin), Samuel B. Pettengil (Indiana), and Robert F. Rich (Pennsylvania).

On September 22 Robert P. Hooper, president of the Wm. E. Hooper & Sons Co., Baltimore, president of the Cotton Duck Association and representing the Textile Merchants of New York, said that at the Atlanta Federal Penitentiary are installed 516 looms for making cotton duck. It is the largest cotton duck manufacturing plant in the United States. It has an annual capacity in excess of 5,000,000 yards of canvas and 500,000 yards of lighter materials which preempts a substantial part of the market of the free mills for No. 5 to No. 8 weight duck required by the Post Office Department. It is also equipped to make any special articles fabricated from canvas such as sails, coaling and laundry bags. And Mr. Hooper declared that "the making of the canvas and the spinning of the yarn at the Atlanta Penitentiary cannot save the Government one cent in actual dollars."

Individual complaints of manufactur-

(*Continued on page* 80)

THE COAL SITUATION

By

J. V. Sullivan

Acting Secretary
West Virginia Coal
Association

COAL, colossal resource of the South and the nation, menaced by obsolete and repressive governmental measures, has implored the United States Supreme Court to write a new declaration of freedom for American industry.

To meet the competition of other fuels that has decreased coal consumption, reduced production, closed thousands of mines, and forced widespread unemployment in the coal and dependent industries, coal seeks from the court an interpretation of the Federal anti-trust laws to permit its orderly distribution and marketing through central sales agencies.

An appeal from the adverse decision of a three-judge court of the Western Virginia District, will determine the legality of Appalachian Coals, Incorporated, a regional sales agency, organized by coal producers in eight southern high volatile districts of southern West Virginia, eastern Kentucky, Virginia and Tennessee. In this selling agency, 137 companies producing less than 12 per cent of the bituminous coal mined east of the Mississippi River sought to prevent a continuation of existing disorderly marketing practices and to provide for more effective competition.

Monopolistic control of fuel consuming markets is not sought by the bituminous coal industry. The tremendous coal reserves of the country, with the continuing growth of oil and gas and water-power consumption, make it evident that a bituminous coal monopoly is an impossibility.

In the Appalachian case, the lower court held that while the situation in the coal industry was chaotic and distressing, the court was bound by opinions of the higher court. The appeal to the Supreme Court is being carefully followed by the copper, cement, steel and other industries which are also concerned in the release of business from the shambles of obsolete legislation susceptible of as many interpretations as there were colors in Joseph's coat.

In the national production of energy, bituminous coal, until the year 1931, ranked first among mineral fuels. Reports of the government show that bituminous coal in 1913—the pre-war year—furnished 70.3 per cent of the national demand for power. This ratio was substantially maintained during the war period. A gradual decline followed until 1930, when official reports show that the supply of energy furnished by bituminous coal fell to 51.4 per cent. In 1931 bituminous coal's contribution dropped to 48.6 per cent of the total demand, or less than 50 per cent for the first time since records were kept. Bituminous and anthracite combined, however, furnished 56.5 per cent of the national energy demand, in 1931, compared with 90.3 per cent in 1899.

The peak of energy demand in the United States was reached in 1929, when 26,534 trillion British thermal units were supplied by coal, oil, natural gas and waterpower. For comparative purposes, the British thermal unit is used as a common denominator. In 1921 the total energy demand was 18,563 trillion B.T.U., yet in 1931 during a year of industrial depression the energy demand of the nation was 20,391 trillion B.T.U., or nearly 10 per cent greater than ten years before. The decrease in the nation's energy demand from the peak year of 1929 to 1931 was 23.3 per cent.

While the energy supplied by bituminous and anthracite coal fell from 90.3 per cent in 1899 to 56.5 per cent in 1931, the nation's energy supplied by oil and gas increased from 7.9 per cent in 1899 to 35 per cent of the total in 1931. In the same period waterpower also increased from 1.8 per cent to 8.5 per cent of the total demand.

These figures, showing the percentage of increase and reduction in the supply of the nation's energy demand, do not convey any explanation or reason for a shift in the sentiment of consumers among the several mineral fuels. Some reasons may be found in causes other than those concerning the utility of the fuel consumed.

One of the first necessities of the coal industry is a reasonable freight rate for its transportation from mine to market. Coal is dependent on transportation service. The facility and cost whereby it reaches the consuming markets are constant factors in promoting the availability of the commodity. Coal operators, therefore, may expect the carriers to give them an opportunity to compete with other fuels in the markets served by the roads. Transportation is the largest item paid by the coal consumer in his fuel bill during the present period of low production costs.

Coal, however, is not dependent entirely on the government and the carriers to restore it to its former place of dominance in the fuel markets. The industry is helping itself and in no uncertain way. Development of the small stoker, accompanied by mechanical firing which produce automatic heat, has been termed the most constructive step taken by the industry in a century.

For many years these devices were confined chiefly to large industrial installations, but the development of the small stoker for household use has met public insistence for automatic heat. It insures to the coal consumers the convenience, cleanliness and comfort secured from some of the other fuels and then meets the public requirements of safety, dependability and economy.

Mechanical firing has enabled the coal industry to meet oil and gas on their own battleground, and the fact that approximately 100 concerns are now engaged in the manufacture of coal stokers indicates in some measure the competitive struggle now being waged between bituminous coal and oil and gas.

Coal production in the nation in 1932 will approximate 300,000,000 tons, the lowest point in 25 years. The heavy decrease was due to the general suspension of industrial activities by steel and other large consumers. Recent increases in the weekly production, largely seasonal in character, also reveal a revival of industrial activity.

The output of the Southern States, Alabama, Kentucky, Tennessee, Virginia and West Virginia, during the first nine months of the current year was 21 per cent less than the production during the same months of 1931. In the rest of the country, however, the reduction in output was at the rate of 28 per cent.

Coal's importance to the welfare of the South is revealed by the fact that it gives employment to 200,000 people. Gradually those coal-producing states south of the Ohio and Potomac rivers have assumed the leadership of the industry. In 1909 the Southern States produced 26.9 per cent of the output of the country east of the Mississippi river. In 1929 that percentage had increased to 48.5 per cent. Even with the decline in production between 1929 and 1931, the percentage of bituminous coal coming out of the South was 51.5 per cent of the national output.

AIR CONDITIONING

A Rapidly Growing Industry to be Important Factor in National Development; Adds to Human Comfort, Increases Manufacturing Efficiency, Creates Employment, and Affords New Outlet for Electric Power

By

Willis H. Carrier

Chairman, Carrier Corporation

THE first step in air conditioning was taken ages ago when man began to heat the air in cold climates. Centuries later it was learned that temperature is only one phase that had to be considered in the modern conception of air conditioning to make our habitations comfortable. We have learned to clean the air; free it from dust and objectionable foreign matter, and also to control any desired condition of humidity which is just as important to our comfort and health as the temperature of the air. In winter we can add moisture to the air alleviating the dryness common to the artificially heated, but un-humidified home or business building. In summer we can, by dehumidification, relieve the muggy oppression of humid days.

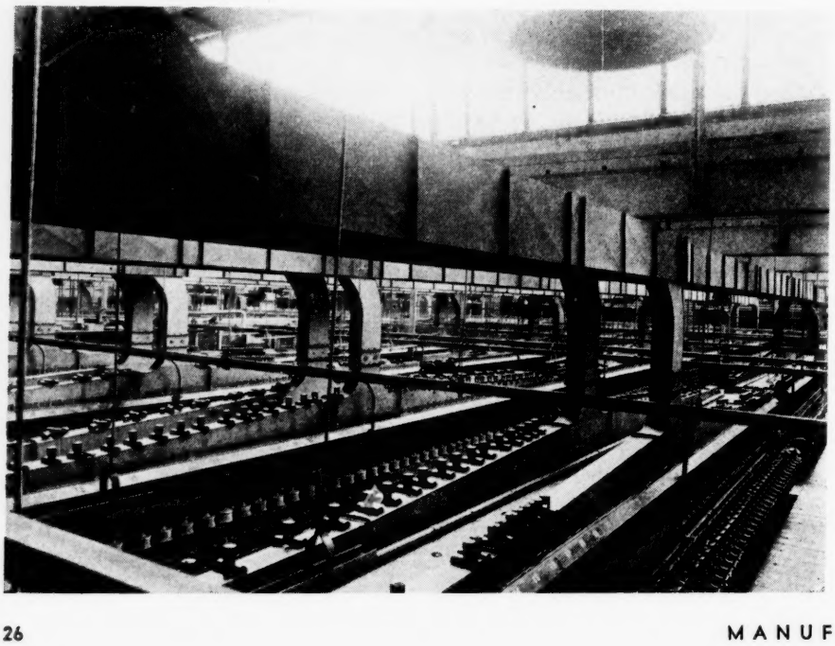
Manufactured Weather for Every Industrial Requirement

As I stated recently before the American Institute of Electrical Engineers, air conditioning, or manufactured weather, found its inception in the demands of industry to produce, independent of weather, seasons or geographical locations, controlled atmospheric conditions for certain products sensitive to climatic conditions. At one time it was thought that textile mills could operate only in regions having a naturally moist climate. Today great mills are running regardless of geographical locations because air conditions best suited to such manufacturing processes are maintained within the mills by modern air conditioning equipment.

Two Main Types

Air conditioning is now applied to a great variety of industrial processes and, therefore, there is a wide diversity in the character and method of its application. The primary purpose of some installations is to produce a humid climate with only a reasonable temperature reduction while in other installations a rigid control of temperature with a lowering of the relative humidity is required. The first type affording merely humidification with evaporative cooling by passing the air through uncooled water sprays, is used in textile mills, tobacco factories, etc. The second type, in which dehumidification as well as cooling must be accomplished, requires refrigeration to cool the spray water so that the moisture content of the air which has passed through it will be less than that of the outdoor air. The temperature of the spray water determines the moisture content. It is possible with this method to control both temperature and moisture conditions independent of weather conditions. Therefore, the second type of air conditioning has a much larger field than the first as it applies to all processes that are affected by temperature and humidity.

Spinning Department in a rayon manufacturing plant showing maze of air ducts and pepper-box distributing ducts over each spinning machine



Now in Use in 200 Industries

Controlled temperature and humidity is now obtainable for the manufacture of confectionery, in modern bakeries, in the manufacture of cigars and cigarettes, and in lithographing. It is used in the automatic packaging and wrapping of goods and in the drying of certain products at low temperatures such as photographic films, chewing gum and summer sausage. It is used most successfully in many processes for the manufacture of ceramics from terra cotta tiles to dishes. The Simonds Saw and Tool Co., Fitchburg, Mass., have applied it as a necessary adjunct to their windowless factory where saws are to be manufactured under artificial light and artificial ventilation, maintaining ideal conditions regardless of external conditions. More than 200 industries have up to now found air conditioning an indispensable servant freeing the progressive manufacturer from daily weather uncertainties, improving the quality of his product and contributing to the health and efficiency of his workers.

Savings Effected

Industrial applications of air conditioning may be said to be warranted whenever the tangible or direct savings will pay for the cost of the installation within three years. Frequently economies effected by air conditioning in-

stallations are, almost startling. In the case of one ceramic manufacturer it was found possible to double his production without increasing his factory floor space as he had intended. The cost of a relatively small air conditioning equipment was only one-fifth of the cost of the proposed increase in building. In addition, the quality of his product was improved and the reduction in losses in production more than paid for the equipment every year. If we estimate the present value of industrial applications of air conditioning in this country at $30,000,000, then under normal conditions they are probably producing economies of at least $15,000,00 annually. The rate of industrial applications is an accelerated one as at present not more than one-fourth of the manufacturers and industries which could be benefitted by air conditioning have as yet availed themselves of these possible economies. If this is true, the possibility of the balance sheet for industrial applications of air conditioning might show annual savings aggregating $60,000,000.

For Human Comfort

Air conditioning for human comfort is the field which I believe offers the greatest potentialities for making a great industry. Although the basic principles and practice of air conditioning have been well known for more than 20 years, it is only within the last eight years that its vast importance in increasing human comfort and efficiency has begun to receive public acceptance.

Results of Research

A most thorough line of research has been carried on for the last ten years by the American Society of Heating and Ventilating Engineers. Many facts regarding the relative effect of temperature, humidity, and air motion have been discovered and coordinated, so that today we are able to tell what the most desirable conditions for an average group of persons are under various conditions. These investigations established a scale of reference which has been termed "Effective Temperature." Professor C. P. Yaglou at Harvard University has measured the various degrees of comfort or warmth corresponding to different effective temperatures. Not all people are equally comfortable under the same conditions. On a large number of subjects tested he finds for example, that in the winter time an effective temperature corresponding to 71 degrees and 40 per cent relative humidity gives the greatest feeling of comfort, while in midsummer conditions with customary clothing the greatest feeling of comfort corresponds to 76 degrees and 50 per cent relative humidity. This is a fact that we did not know until recently, nor until the effective temperature scale was devised did we have any means of correlating conditions of temperature, humidity and air motion.

Commercial Success

The commercial success of air conditioning has been dependent upon scientific research work. The first installation of air conditioning in a theatre in New York City in 1924 paid for the entire installation the first summer that it was operated. In a department store, air conditioning pays its way. The lower floor and basement where nearly one-half the sales are made are usually conditioned. The cost of owning and operating an air conditioning system is less than one-half of 1 per cent of the total sales for the year. Today air conditioning is being applied to entire office buildings at an owning and operating cost of from 18c to 25c a square foot of rentable area. Part of this cost is applied to the expense of ventilation and additional heating which would be required in any event, and therefore it is fair to say that the increased cost of air conditioning would be from 14c to 20c a square foot annually. The cost of cleaning and renovating are reduced practically one-half and locations that otherwise would be undesirable become readily rentable.

The railroads and the Pullman company are looking forward to completely conditioned trains. The Baltimore and Ohio, followed closely by the Santa Fe and the Missouri, Kansas and Texas Lines were the pioneers in the development. The latest improvement in its application to railroads is the use of train line steam directly for cooling the water used in air conditioning, greatly simplifying the equipment.

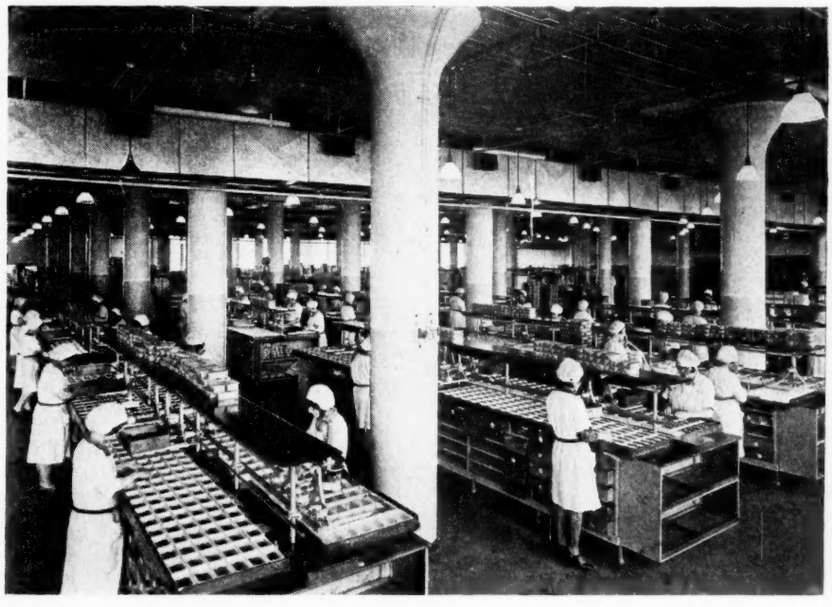
Industrial Development

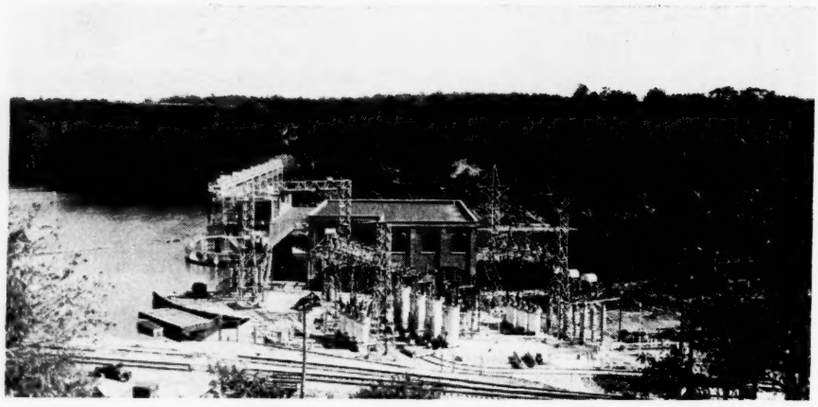
Air conditioning offers great possibilities as an industry from the standpoint of the manufacturer. The equipment is an assembly of various types of mechanism; heating and cooling, equipment, fans, pumps, control apparatus, motors and turbines, etc. In addition, there must be fabricated on the job sheet metal ducts and special outlets. Most important, the new industry offers employment in the fields of engineering service and manufacturing, in the designing, making and installation of equipment. It is estimated that from mine or factory to consumer, it means the potential employment of over 500,000 people.

Increases Power Consumption

The value of the air conditioning load to the power companies is indicated by the fact that the annual power consumption corresponding to the cumulative sales of equipment would be more than one-sixth of the annual sales of equipment in the corresponding year, although the increase in power consumption for any year is less than 2 per cent of the corresponding equipment sales for that year. Such a projected advance in air conditioning would mean an increase in power consumption for the United States nearly equal to the total now supplied to the whole Metropolitan district of New York. A further advantage than volume to the power companies is that it is also a desirable type of load. The summer load is at present about 75 per cent of the winter load, while the air conditioning load is predominantly a summer load. An addition of one-third to the present summer load, if it were possible, would probably greatly increase the economy of operation and thus increase profits to the power companies as well as reduce the rate to the users.

Packing room in a candy factory where a modern air conditioning system keeps confectionery always in perfect condition





Appalachian Electric Power Company's New Hydro-Electric Development on the James River at Reusens, Va., near Lynchburg

POWER DEVELOPMENT CONTINUES

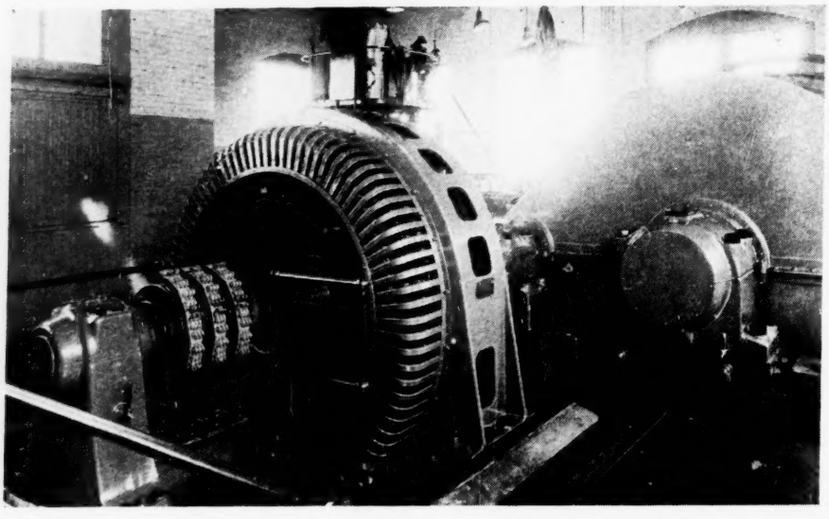
WHILE only a comparatively few outstanding power projects have been completed or put under way this year in the South, favorable progress in the expansion of this branch of industry can be reported. Manufacturers have devoted more than a normal amount of attention to development extensions and to refining and perfecting various lines of equipment. An unusual amount of research and design work has been carried on.

Largely as a result of the building of the elaborate network of natural gas transmission lines in recent years through the South and Southwest, and due to the comparatively low price of fuel oil, there has been a remarkable development on the part of small industries in the utilization of natural gas engines and Diesel engines.

Poor business conditions have not seriously deterred the farm electrification movement. During 1931 a gain of 7.5 per cent in the number of farms served was made over 1930, so that at the end of the year some 700,000 farms were receiving service.

Interconnection of electric transmission systems continues to go forward. Washington, D. C., is to have the advantages of an additional outside source of supply from a large and comprehensive power system, through arrangements whereby power produced at the new Safe Harbor hydro-electric project of the Pennsylvania Water & Power Company will be available. The development, connected through tie lines with hydro and steam plants at Holtwood, Pa., which have a combined capacity of 180,000 horsepower, is part of the coordinated hydro and steam power system of which the 346,000 horsepower capacity steam plants of the Consolidated Gas, Electric Light & Power Company, Baltimore, constitute the principal reserve. The Safe Harbor plant, which has an initial installation of six 42,500 horsepower turbines, is designed to have an ultimate capacity of 510,000 horsepower. A 230,000-volt line transmits the Safe Harbor power to Baltimore, the nearest point to Washington on the line being at Ellicott City, from which place a 23-mile line runs to the Capital.

Allis-Chalmers Hoist Motor of 1500 Horsepower Used in Modernizing the Hoisting Equipment in the Birmingham District

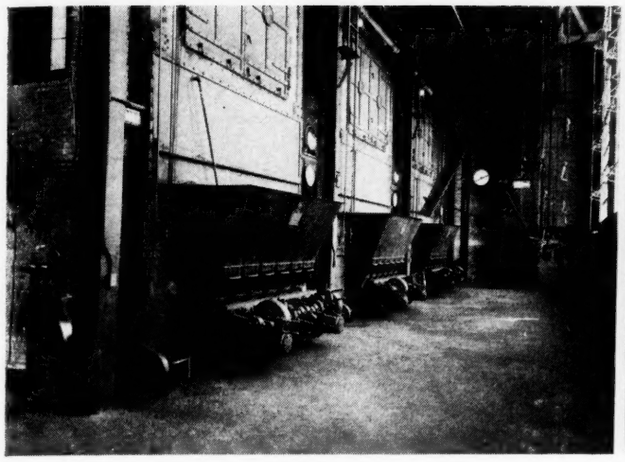


As a result of this comprehensive power hook-up the Consolidated Gas, Electric Light & Power Company, the Safe Harbor Water Power Corporation and the Pennsylvania Water & Power Company will supply power for electrification of the Pennsylvania Railroad Company's lines from the Susquehanna River crossing at Havre de Grace through Baltimore to Washington. One of the largest made in recent years, this power contract is for a period of 20 years. The Pennsylvania Railroad's electrification program between New York and Washington is one of the outstanding examples of steam road electrification.

Power companies in the Southwest that have carried on ambitious expansion programs in recent years have largely concentrated during 1932 on rounding out their systems by the building of lines to serve fast growing areas, notably oil producing sections, where electricity is used for drilling, welding, pumping, lighting and a multitude of purposes. Also, numerous isolated plants have been acquired and dependable central station power made available. This has called for substations, transformer banks and allied construction.

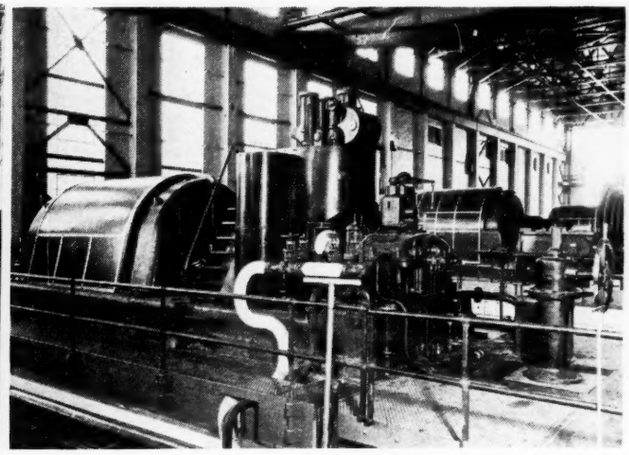
A notable hydro-electric plant completed this year is a 13,500-horsepower station of the Central Power & Light Company of San Antonio, Texas, which is driven by water from the Rio Grande obtained from a 32-mile irrigation canal of the Maverick County Water Control and Improvement District No. 1. The entire project involved an expenditure of approximately $6,000,000.

Among the outstanding power developments planned are: Current River Power Co., Kansas City, for a 26,000-horsepower plant on the Current River above Doniphan, Mo., in Ripley, Carter and Shannon counties; the Appalachian Electric Power Co., New York, proposes a hydro-electric development on the New River in Pulaski county, Va., estimated to involve the expenditure of $12,000,000; two subsidiaries of the Union Carbide & Carbon Corp.—the New Kanawha Power Co. and the West Virginia Hydro-



Power Plant of Liggett & Myers Tobacco Co., Inc., Durham, N. C.

Three 450-horsepower Springfield boilers fed by three 6-retort Detroit underfeed stokers



Deepwater Steam Electric Station

Turbine room of the Houston Lighting & Power Company which has installed generating capacity of 147,000 kilowatts

Electric Power Co.—pushed work on two correlated power projects this year. The Hawks Nest hydro-electric project of the New Kanawha Power Co. on New River, W. Va., comprises a dam 60 feet high, a 16,250-foot tunnel through rock and a station with four units of 30,000-kv-a. capacity each. The steam power station, which has been completed, comprises two turbo generator units of 30,000-kv-a. each. The two plants are connected by a transmission line six miles long, so that the steam plant may supplement the power output of the hydro plant during periods of low water.

Numerous new boiler plants have been installed by established industries for steam power and processing. Many industries have taken advantage of the opportunity afforded in recent months to modernize existing power plants by replacing obsolete equipment.

175-Foot Suspension Tower

Carries lines of Virginia Electric Power Co. across Roanoke River. Stone & Webster Engineering Corporation, builders

A new power plant at the Spring Grove State Hospital, at Catonsville, Md., consists of two 480-horsepower and one 280-horsepower Keeler boilers, fired with Flynn & Emrich underfed stokers, coal being fed into the hoppers through an electric overhead track system of the Cleveland Electric Tramrail Company. Ashes are removed from the rear of the boilers so as to keep dirt away from the moving machinery.

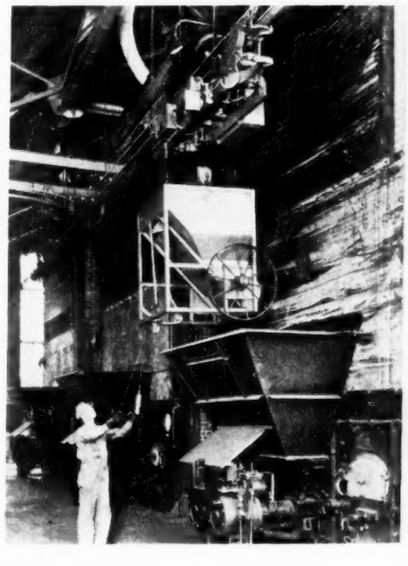
Indicative of the modernization movement in the South, the Detroit Stoker Co. conducted a survey which shows that 43 of its stokers were in use in 14 widely scattered Southern cities at the end of October. Tennessee Paper Mills in North Chattanooga, Tenn., installed a unit pulverizer system in its boiler plant addition. At the Wilson, N. C., municipal power plant two Babcock & Wilcox boilers of 900 horsepower each, a 5000-kilowatt Westinghouse turbo-generator and a Foster-Wheeler surface condenser, have been installed.

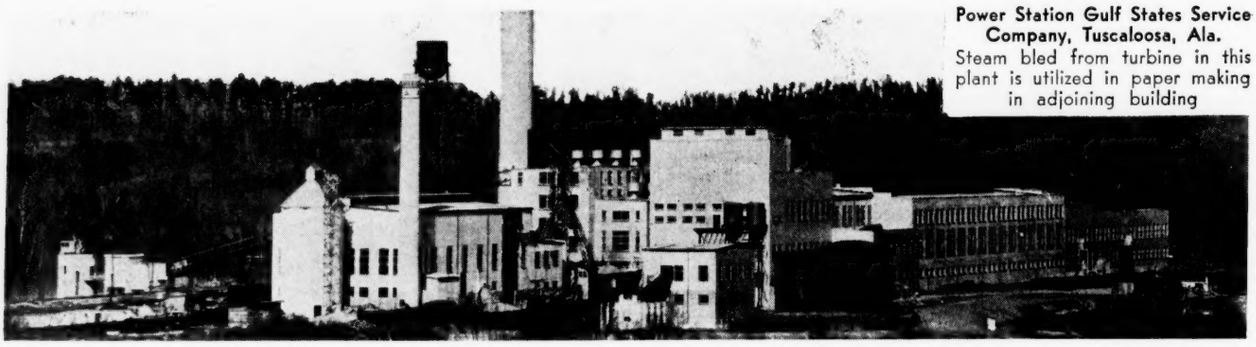
The Appleton Company at Anderson, S. C., installed two boilers of 512 horsepower. The Swift Manufacturing Co., Columbus, Ga., has put in stoker equipment, Robert & Co., Atlanta, being the engineers. A new boiler plant featured an expansion program at the Parkersburg, W. Va., plant of the Viscose Co. The Pendleton Mfg. Co. is erecting a new boiler house at La France, S. C. The Rock Hill Printing & Finishing Co., Rock Hill, S. C., installed a 550-horsepower Babcock & Wilcox boiler and an American stoker.

One of the largest central heating plants so far constructed is that under way to serve a majority of the public buildings in Washington. A building, 202 feet long, 108 feet wide and 140 feet high, the interior of which will be faced with enameled brick, will house the plant, which will comprise six Walsh & Weidner 25,243-square foot boilers, with furnaces and firing equipment designed for a maximum hourly evaporation of 237,000 pounds of water in each boiler. The stoker of each boiler is designed to burn a maximum of 20,000 pounds bituminous coal hourly. The stacks are concealed by the building structure. Two 1000-kilowatt turbo-generators will supply power to most of the station auxiliaries. The plant will be equipped with a complete system for receiving, conveying, preparing and storing coal, including all necessary hoppers, conveyors, skip hoists, crane, etc. It will have complete systems for handling and disposing of ashes, including ash hoppers and grinders, ash handling and sump pumps, hydraulic ash conveyor system, water reclaiming system and vacuum type cinder and dust conveyor system. The steam distribution system designed for 300 pounds maximum working pressure, involves several miles of pipe of up to 18 inches in diameter in tunnels and conduits of reinforced concrete.

Boiler Plant, Spring Grove State Hospital, Catonsville, Md.

Keeler boilers fired by Flynn & Emrich heavy duty underfed stokers—overhead track system supplied by Cleveland Electric Tramrail Co.





Power Station Gulf States Service Company, Tuscaloosa, Ala. Steam bled from turbine in this plant is utilized in paper making in adjoining building

POWER PLANTS AND INDUSTRIAL EARNINGS

High-Pressure Steam Systems and Improved Fuel Burning Equipment Increase Efficiency

By

C. W. E. Clarke

and

E. B. Severs

United Engineers and Constructors, Inc.

ALL manufacturing processes use power or heat or both. In the early days power was supplied by hand or water power or in some instances by mule or horse tread mill. A little over a century ago the steam engine began to be used to produce power for industry. The steam engine had been used since about 1700 for water pumping but it was not until about the beginning of the 19th century that the engine reached a state of development which fitted it for use in general industry. The first three quarters of the 19th century saw but slight development of the means for producing power for industrial use. However, starting about 1880 methods and equipment for power production were developed with an ever increasing rapidity and the last decade has witnessed advances that all but revolutionized the power and heat problem in industry.

In many industries the heat-power cost represents a considerable proportion of the total operating expense. The economies that can be realized today as a result of improvements in the heat-power field are in some cases so large as to be startling in their effect upon net income. It is important to bear in mind that a dollar saved in power and heat cost is a dollar added to net income.

In practically all industrial processes where heat and power are used the two are so closely associated that one cannot be considered without giving due weight to its relation to the other. Power is always a product of heat and the power may in certain circumstances be converted back to heat for process use. Wherever steam is required for heating in industrial process power may very economically be produced from that steam before it is utilized in process heating.

In the chemical industry, the textile industry, the paper industry and many others that need not be specifically mentioned large quantities of steam are used for cooking, evaporation and drying. Up to quite recent years no special attention was paid to the pressure at which this steam was generated and distributed because the economic possibilities of proper selection of pressure and generation of by-product power were not generally appreciated. Consulting engineers and the manufacturers of steam and power machinery have been working to educate the business executive and awaken in him an appreciation if not an understanding of the importance to his cash balance sheet of a properly designed heat power system. As a result of this campaign many manufacturing plants today contain equipment which to some extent takes advantage of possibilities for economical amalgamation of the two supplies into a properly coordinated system. However the advances in the knowledge of methods and design of equipment for accomplishing the most economical combinations have been so rapid in the last few years that few of these plants embody more than a step towards what may practically and economically be accomplished.

Pulverized fuel and blast furnace gas fire these boilers for the Youngstown Sheet & Tube Company, Youngstown, O.

The advance which is the most important to industry in general in connection with their power and heat supply is that of increasing steam pressure and temperature. Not many years ago 250 pounds per square inch was looked upon as a high steam pressure for the industrial power plant. In the intervening years many installations have been made at much higher pressures and operated with no difficulty attributable to the pressure. As a result it has become apparent that there is nothing inherent in high steam pressure that should cause industrial establishments to hesitate in adopting it.

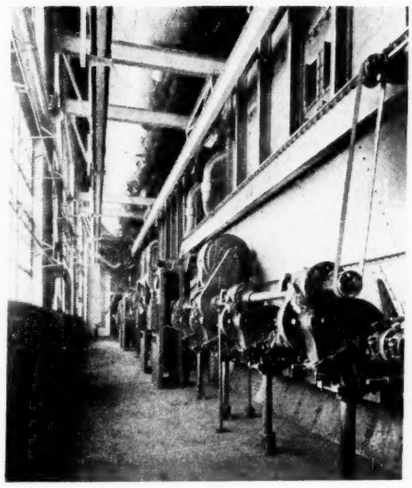
The incorporation of a high pressure

steam system into a manufacturing plant which uses a large quantity of steam in its processes makes possible the generation of electrical energy at very low cost. No generalization can be made as to the quantity of power that can be produced in this manner. It depends upon the conditions existing in the particular establishment under consideration. It can safely be stated that there rarely is a plant in which steam in any considerable quantity is used for process in which a high pressure steam by-product power system is not profitable.

An important feature of the high pressure by-product power system is that it usually can be incorporated into an existing power plant. The effect is to convert a relatively inefficient power producing system into one having an economy commensurate with the most modern power plants.

Where the boilers in a plant using steam at 100 to 200 pounds have reached an age and condition at which their replacement is necessary the adoption of high steam pressure is especially profitable. The replacement may be made with high pressure boilers costing little if any more than new boilers for the original pressure. A turbine to receive the steam from the new boilers and exhaust it at the pressure of the old steam header system can be installed at a very low cost per kilowatt of capacity.

Great improvements have been made in fuel burning equipment and in the design of the furnace-boiler combination. Boiler and furnace efficiencies are now obtainable in normal every-day operation that only a few years ago would have been considered remarkable under test conditions. One of the difficulties that has been a serious drawback in many fuel burning installations is the limitation of the types of fuel that can be successfully burned in a given installation. A stoker designed to burn a semi-bituminous coal from West Virginia could not be operated satisfactorily with an Illinois coal. Stoker design has been improved and the diversity of coal types that can be handled on a given stoker has increased.



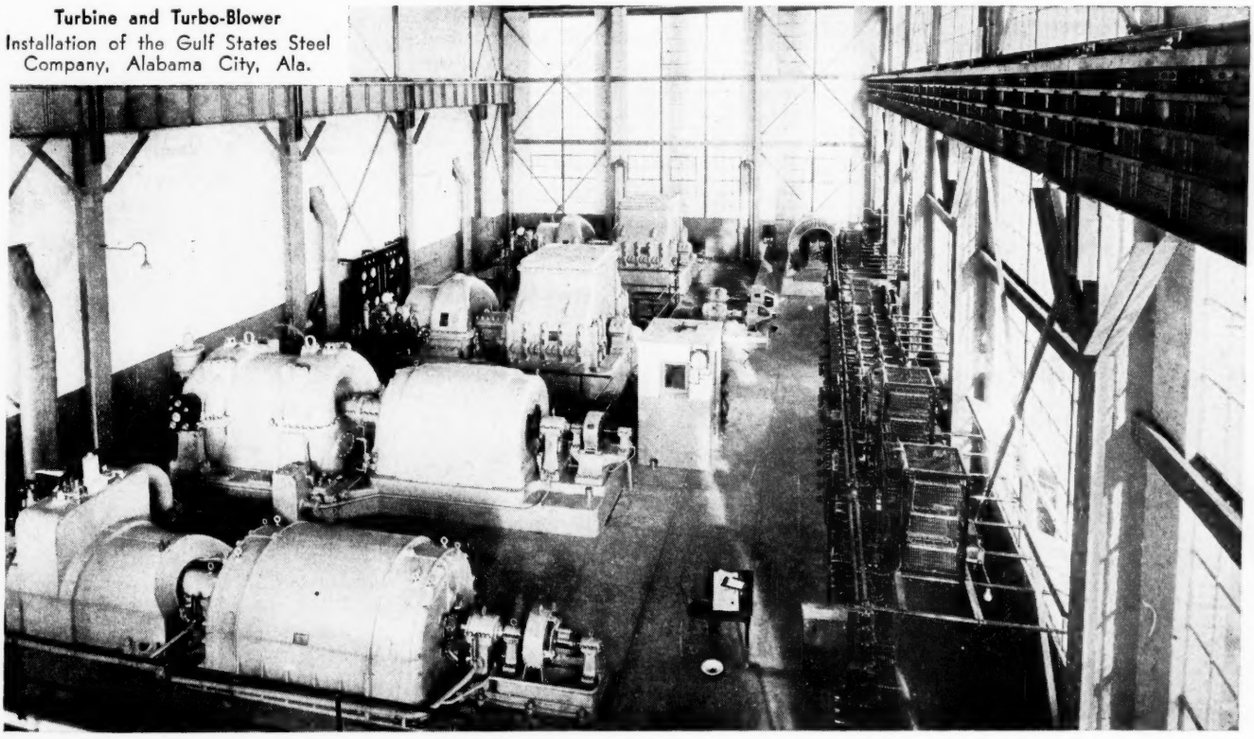
A battery of coal stokers in the boiler room of the Pittsburgh Plate Glass Company, Columbia Chemical Division, Barberton, O.

The development of successful methods of burning coal in pulverized form has taken place almost entirely within the past fifteen years. This development has made possible the use of fuels that with equipment previously available could not be used at all with any degree of success. Such fuels as petroleum coke, metallurgical coke breeze, and anthracite culm are today being pulverized and burned under boilers with relatively high over-all economy.

In some cases it is desirable to use two or more different fuels at different times or together under a single boiler. For this purpose combination burners have been developed which will burn gas and oil, gas and pulverized fuel, oil and pulverized fuel or others. These developments are of advantage in instances such as the steel industry where coke oven gas, blast furnace gas and coke breeze are available as waste fuels. These different fuels may be available at different times and the burning system must be capable of using the various fuels when and as they are available.

Of course along with these improvements and with the diversification of the problems to be met in designing industrial power-steam systems comes the necessity for more complete study and engineering of each installation. In the earlier days the plant engineer could have sufficient knowledge and experience to design a system that with the limited equipment available was quite satisfactory. Today the comprehensive design of such systems requires knowledge and experience gleaned in many fields. However the cost of study sufficient to secure the best system that modern knowledge and equipment will produce is well repaid in economy and reliability.

Turbine and Turbo-Blower
Installation of the Gulf States Steel Company, Alabama City, Ala.



DIESEL ENGINES AND DECENTRALIZATION

By

M. J. Reed

Secretary

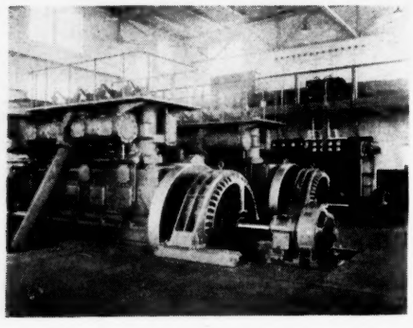
Diesel Engine Manufacturers' Association

STUDENTS of economic and sociologic trends are of the opinion that the period of industrial centralization which was in full career a few years back has been subject to modification by the recent growth along decentralized lines. This growth has been promoted and made possible by a source of cheap power in the form of the Diesel engine. It is an extremely efficient prime mover from the standpoint of getting the most work out of a given quantity of fuel. This is not surprising in view of its principle. The surprising fact, however, is that practically any size Diesel engine has the same high fuel efficiency—from 100 to 20,000 horsepower.

The best thermal efficiency does not always mean the lowest overall power cost, of course; and steam stations of 100,000 horsepower and larger can better the cost of 10,000 horsepower Diesel plants because the size of the former makes it possible to utilize very low grade fuel, to operate with low attendance ratios, and to build at a lower cost per horsepower. There are, however, a limited number of locations for 100,000 horsepower plants—there must be abundant water for condensing and there must be a concentration of users able to absorb a profitable output.

In the past several years various national figures more wise in politics than in engineering have advocated gigantic superpower systems; the power plants to be either hydraulic and therefore located on large rivers, or steam and located at coal mine mouths, the user to receive this power by means of far-reaching power line networks. The utilities themselves have opposed these schemes on sound economic grounds. They have pointed out that the utility investment is already $370 per kilowatt installed, resulting in annual fixed charges of about $45 whereas the annual revenue at its highest (1925) was only $73 per kilowatt capacity. Any greater concentration of plants would increase the investment, on account of the transmission systems required and increase total costs not only because of the higher fixed charges but also because of increased transmission losses.

Two 560 Horsepower Fairbanks-Morse Diesel Engines in the Whitewright Texas Plant of the Texas-Louisiana Power Company



Had these political advocates of cheaper power known more of engineering they might have advocated Diesel power for territories of low user density to much better effect. For instance, there are many cities of 2000 to 20,000 population with a corresponding industrial load which are located 50 miles and up from the nearest super-power station. The fact that the super-station can put power on the switchboard for one-half cent per kw. hr., fuel and labor cost means nothing to these towns, for by the time this power cost is augmented by normal fixed charges as well as by transmission line fixed charges and transmission line losses, it has become anything you like, depending upon the distance involved.

Many power companies and municipalities are solving this problem today by installing Diesel plants instead of relying on costly high lines. The average Diesel power plant of 1000 to 10,000 horsepower can be built today complete for $80 per horsepower or $120 per kilowatt—some say $100 per kilowatt. The average small city distribution system will not result in an entire system cost of over $175 per kilowatt. The saving of more than half of the system fixed charges and the avoidance of transmission losses will, in a large number of cases, be found to materially overbalance the slight increase in station operating cost due to small size.

The most spectacular illustration of the Diesel trend is the new plant being built for the city of Vernon, Cal. When completed this plant will contain five 7000 horsepower Diesel engine generator units. The trend is going on extensively in less spectacular plants, however. Naturally, the oil states and their neighbors—Texas, Oklahoma, Kansas, Louisiana, Missouri, Arkansas—furnish the largest number of instances. One utility company alone, which operates mostly in Texas, has some 20 Diesel plants, ranging in size from very small to 5350 horsepower.

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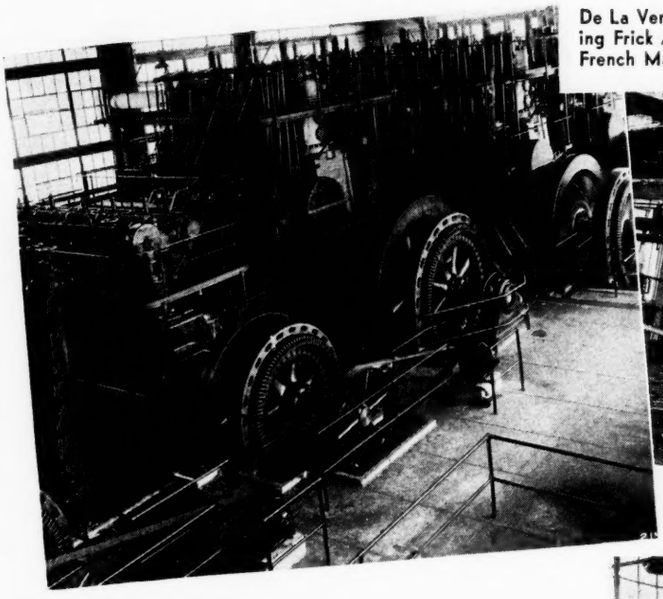
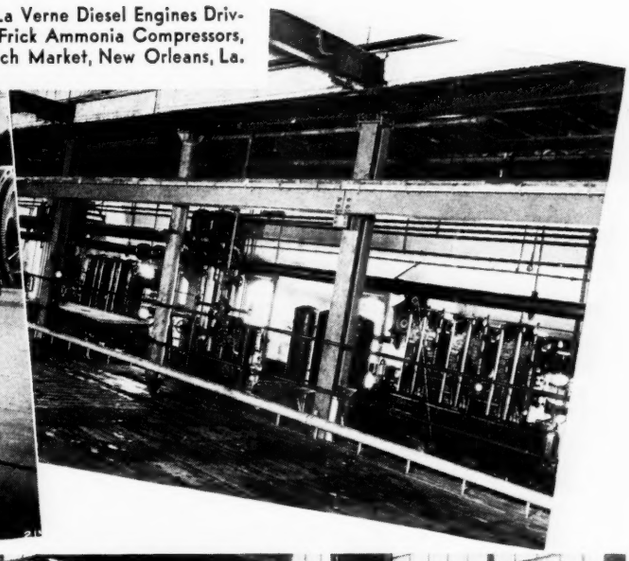
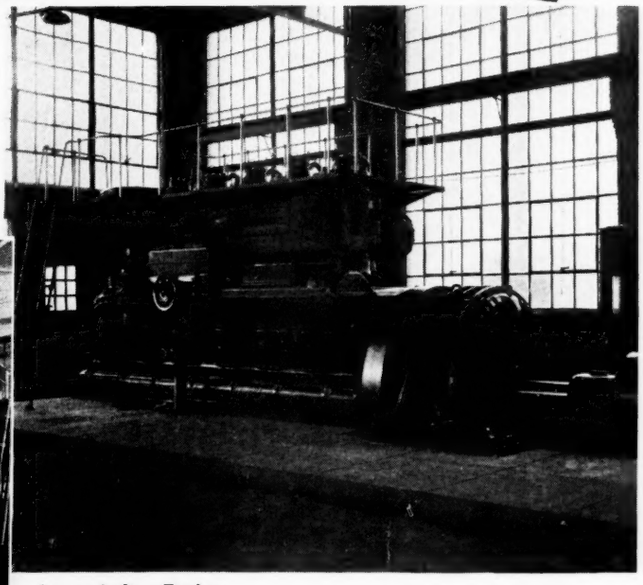


Above—McIntosh & Seymour Engines St. Petersburg (Fla.) Municipal Power Plant

De La Verne Diesel Engines Driving Frick Ammonia Compressors, French Market, New Orleans, La.





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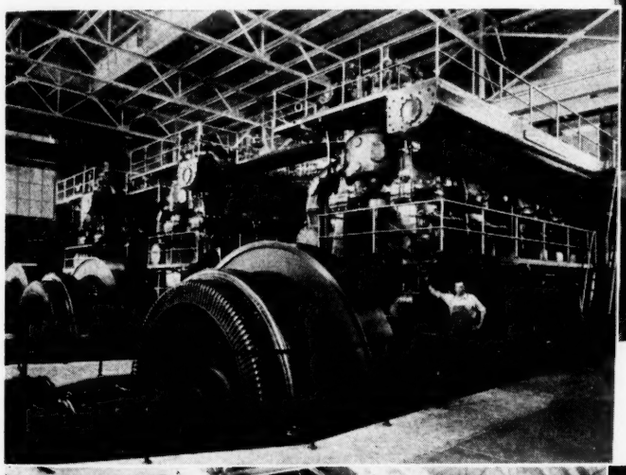
Below—Three 2250 H. P. Nordberg Diesels, Commerce Mining & Royalty Co., Cardin, Okla.



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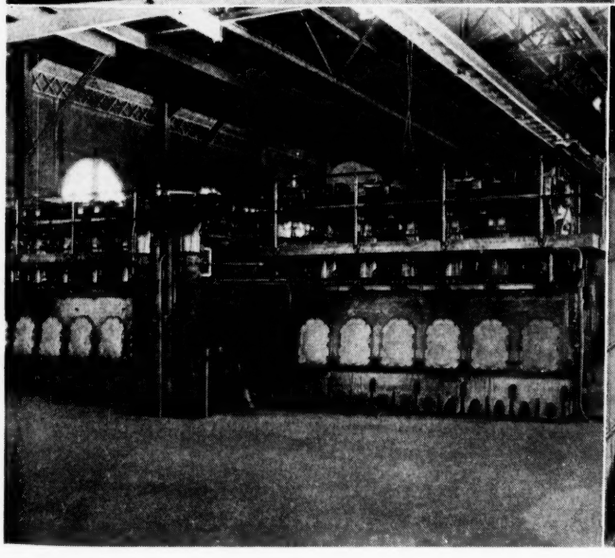

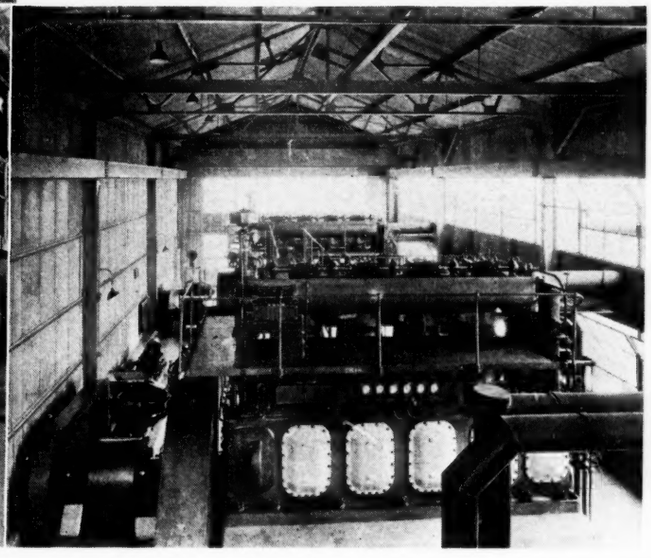

Worthington Engines in Prairie Pipeline Company Station

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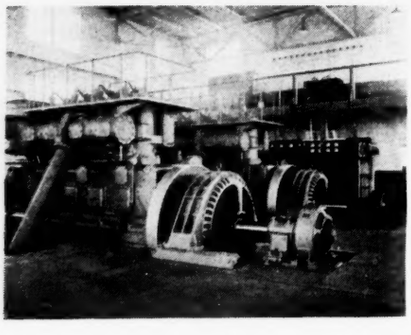

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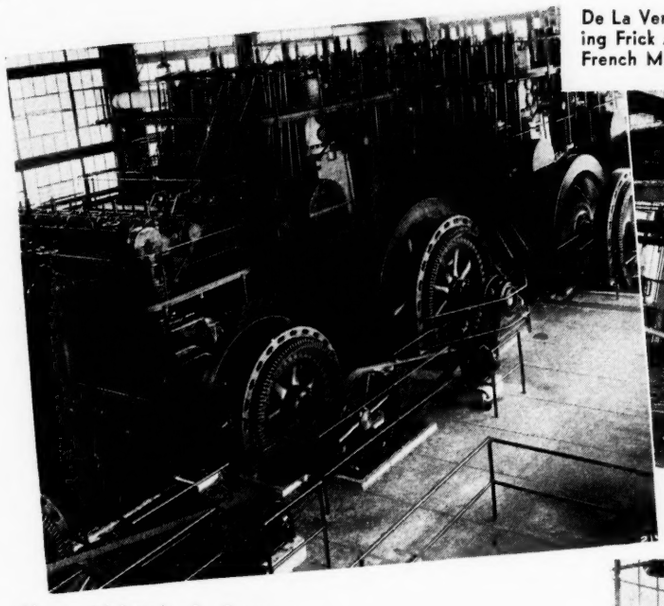

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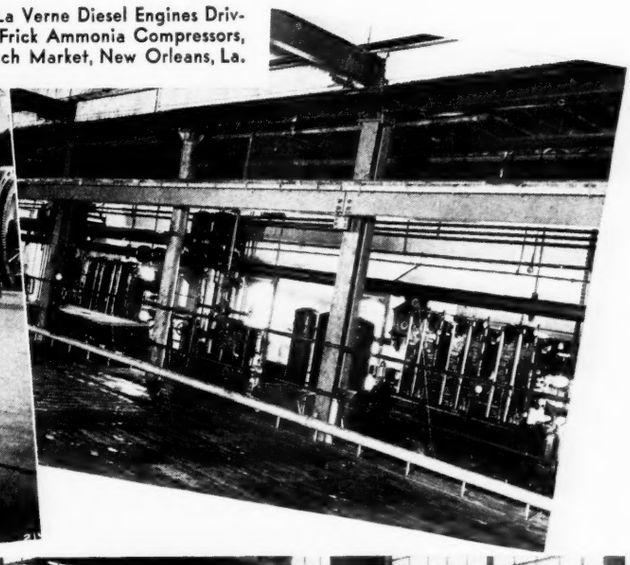

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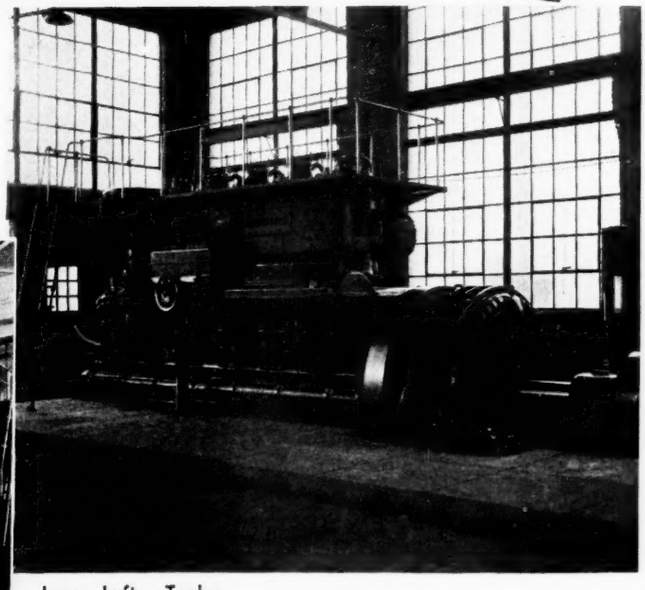

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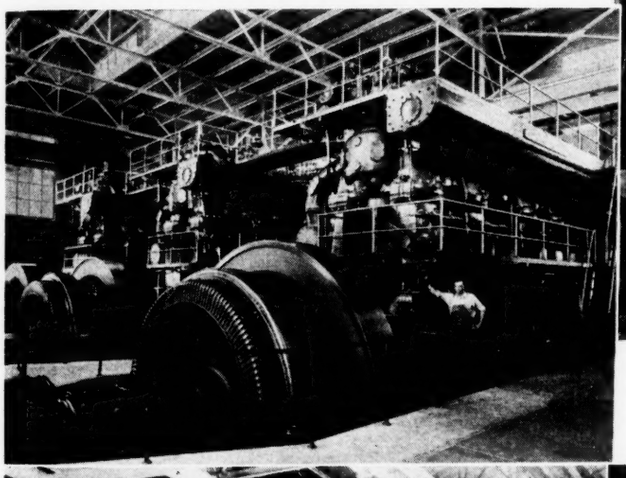

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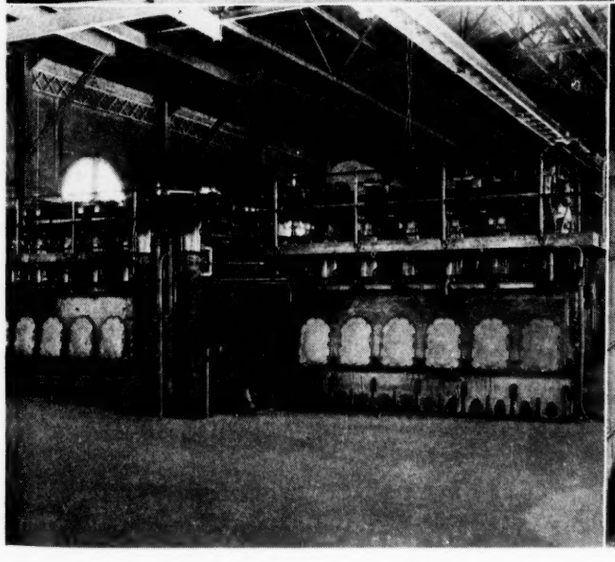

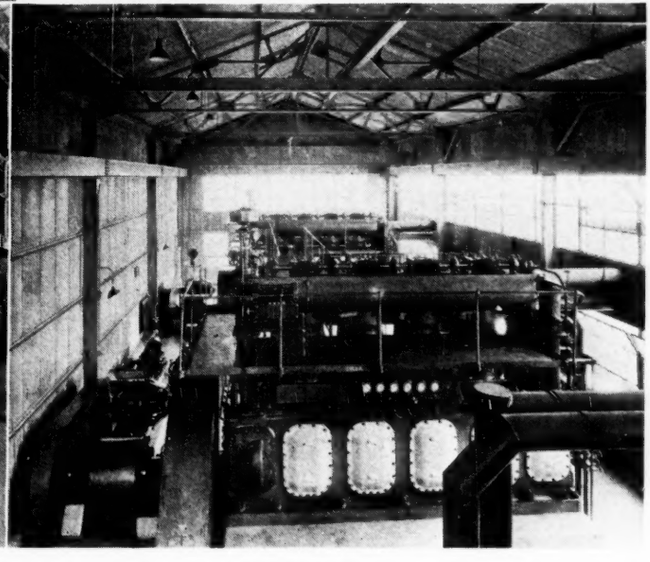

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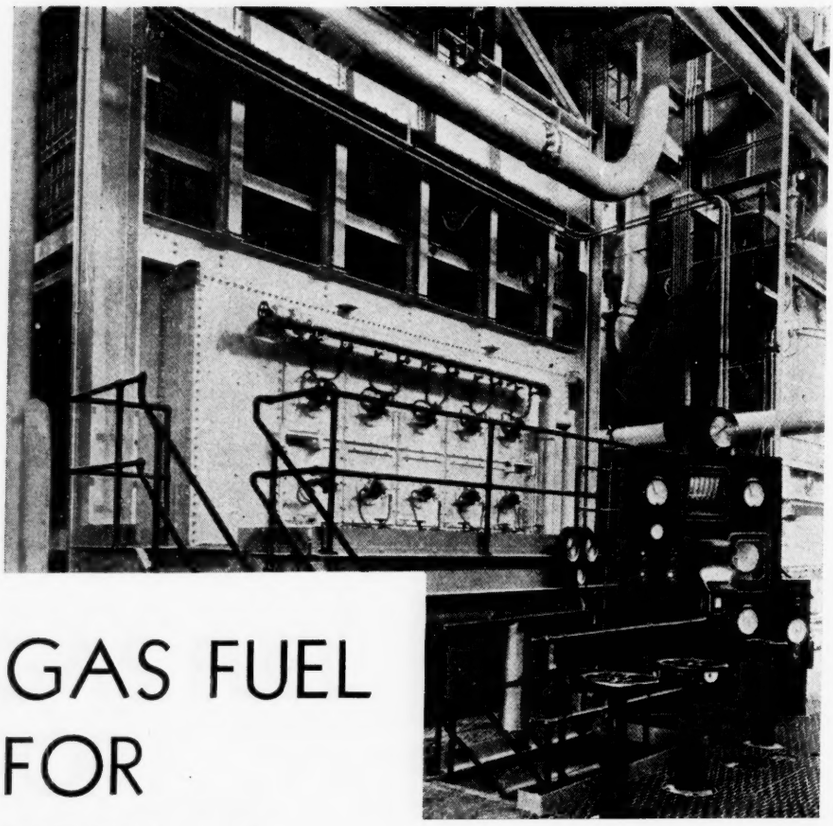


Operating Floor Station B Power Plant at San Antonio, Tex.

The highest steam generating unit in an American central station power plant—Note gas burners in front

GAS FUEL FOR STEAM POWER

By

J. B. Nealey

THE science of steam generation and the subsequent use of the steam in the generation of electricity is undergoing many changes all of which converge at the common focal point of lowered cost of unit production. Not the least of these is the rapid expansion in the use of natural gas fuel under the boilers. This trend becomes significant when account is taken of the progress made in the economic utilization of coal. For instance, coal consumption in central steam-electric stations in 1919 amounted to 3.2 lbs. per kilowatt-hour. This was reduced to 1.84 lbs. in 1928 and to 1.65 lbs. in 1929, while less than a pound per kilowatt-hour is today's possibility. In the same period, the use of natural gas in steam-electrical generation increased approximately 160 per cent and is still increasing in spite of conditions.

Furthermore, a factor of immense economic importance affecting the electrical industry is the comparatively recent development of a cheap way to transmit power. This is power in the form of gas transmitted in pipe lines at low cost, making it possible to secure economy through the development of a large number of small electrical generating stations located at centers of consumption and fed by a long pipe line from a natural gas field. That long distance transmission for natural gas is already an accomplished fact is evidenced by three lines each about 1000 miles in length that have been laid. Recent discoveries of several major fields have given impetus to this movement.

Another important trend is the remarkable improvement in design of steam generating equipment. It was only about ten years ago (1921) that information on steam was limited to pressures of 200 lbs. per sq. in. or less, and it was not until 1924 that the first steam turbine operating at 600 lbs. was installed. This was followed in 1925 by a 1000 lb. steam turbine and in 1926 by one operating at 1200 lbs. pressure. Many have been built since to operate at higher pressures.

A good example of these trends is apparent with the Public Service Company of San Antonio, Texas, which uses gas in all of its plants and has recently installed one of the latest design boilers in its Station B plant. This boiler is equipped with a superheater, steam reheater, economizer and air preheater and will stand a pressure of 1450 lbs. with steam at 815 degrees F. There is only one other boiler installation comparable with this one in the state of Texas and only a few in the United States. In fact, it stands today as the country's highest pressure turbine generating plant.

This concern serves the city of San Antonio and the surrounding territory with electricity and has three plants. Two of these, located in the city of San Antonio, are known as Stations A and B, while the third, which is at New Braunfels, Texas, is called the Comal Plant. The steam supply at the Station B plant was maintained with 18 boilers —16 Stirling and 2 Heine. They were divided into two sections, one being the low pressure 150 lb. side and the other the high pressure 200 lb. side. On the low pressure side the section consists of eight boilers with 100 per cent rating of 500 BHP each, while on the high pressure side are eight boilers with a rating of 500 BHP each and two at 1000 BHP each, giving the plant a total of 10,000 BHP at 100 per cent, but the boilers carried more than this.

Recently a high pressure Foster Wheeler steam generating unit, with a Connelly boiler, of the cross drum, sectional header type, was installed. This boiler is direct connected to an 8000 KW turbo generator to which it delivers steam at 1300 lbs. at the throttle, and the steam is exhausted from the turbine at 200 lbs. pressure. This exhaust steam is piped into a 12,000 KW low pressure turbine set. The maximum capacity is 215,000 lbs. of steam per hour.

Steam is raised with ten gas burners, arranged in two rows, and firing directly into the fire box, the hot products of combustion rising up through the boiler tubes, the economizer, the air preheater and out the stack. Forced and induced drafts, created by motor driven fans and blowers, control the flow of heat, and, just before it passes out the stack, it is used in the preheater to heat fresh air for combustion at the burners.

The air preheater is of the plate type and includes six interchangeable sections arranged in two parallel groups, the fresh air entering the two center sections at the center and leaving the bottom section at the outside ends. This unit will heat 192,500 lbs. of fresh air to 342 deg. F. and in so doing reduces the temperature of the flue gas from 520 deg. to approximately 350 deg. F. It has a heat exchange surface of 13,900 sq. ft. This fresh air is taken from the space over the boiler, forced by fan down through the air preheater and from then

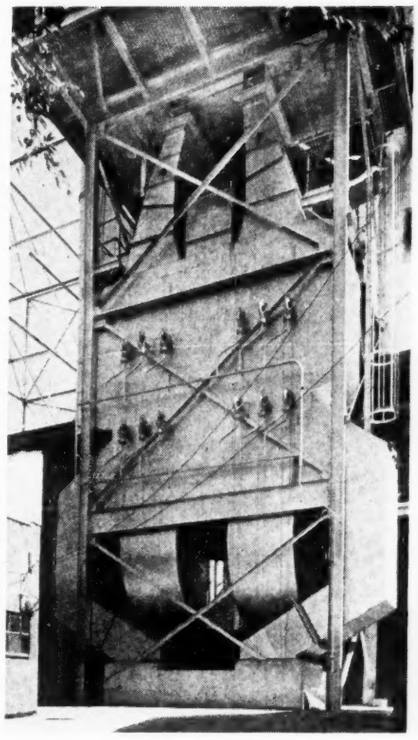
Central Power Station at San Antonio Which Uses Gas for Fuel Is One of the Country's Highest Pressure Steam Turbine Generating Plants

on down under the floor to the gas burners. This forced draft is damper controlled.

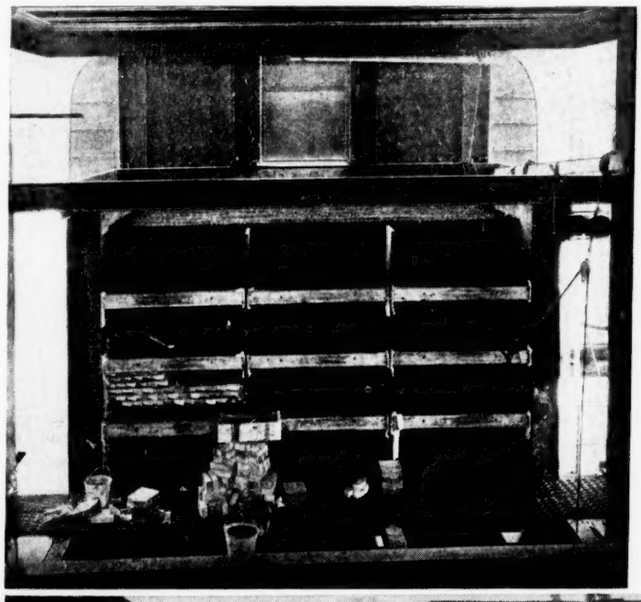
This steam generating unit includes, besides the boiler and air preheater, a convection type, high pressure superheater, a steam to steam reheat superheater and an extended surface economizer, and the furnace is equipped with water cooled walls. The flue gases make a single pass through the boiler and two passes through the superheater, the latter being located between the main boiler tubes and the circulating tubes. They then pass through the tube economizer and air preheater. The superheater has a total surface of 4640 sq. ft. and will superheat 196,000 lbs. of saturated steam to 810 deg. F. the outlet pressure being 1362 lbs. The economizer has 11,800 sq. ft. of external heating surface and the flue gases entering at 1200 deg. F. are cooled to 520 deg. F. at the exit. It heats the feedwater from 371 to 539 deg. F., the water and gases flowing in opposite directions, the counter flow principle so frequently used in heat interchange units.

The steam reheat superheater, built to withstand a working pressure of 1450 lbs.. is located above the boiler and the steam header is made from a solid steel plate machined out to provide space for the high pressure steam entering the tubes and the condensate leaving the tubes. The heating surface includes 600 tubes with a total surface of 2030 sq. ft.

When the steam generating unit is fired by natural gas the efficiency including the reheat varies from 81 per cent to more than 83 per cent, depending upon the rating. These figures are based upon a maximum dry gas loss of 6.6 per cent and a constant unaccounted for loss of 3 per cent, the balance being loss due to moisture formed by combustion.

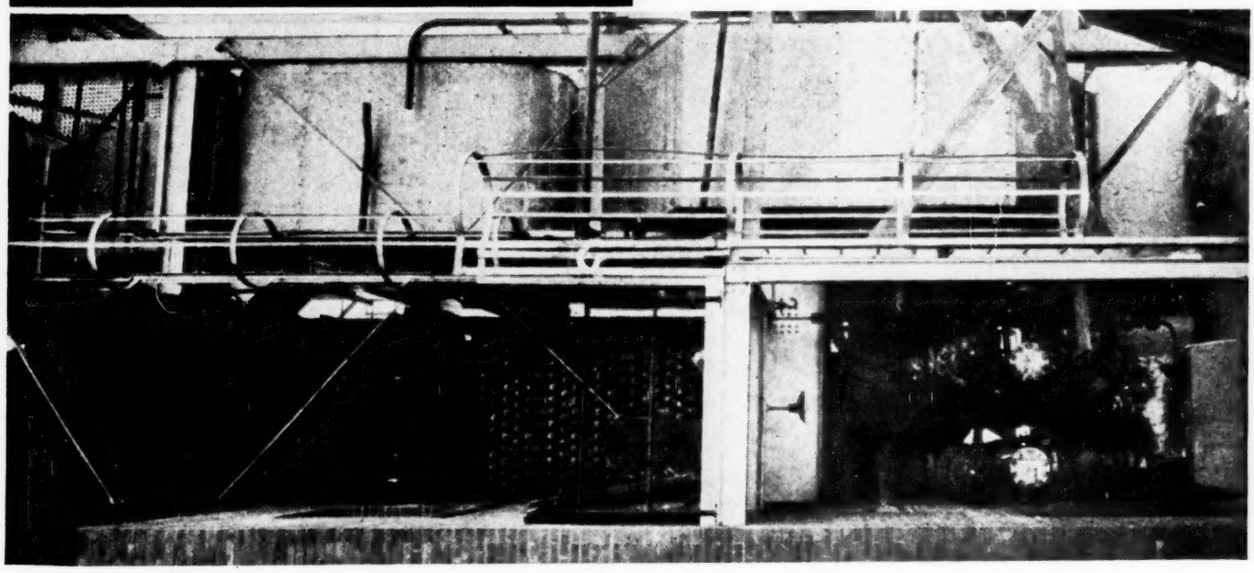


Air Heater Was Placed Outside of Station B Power House



High Pressure Economizer
Foster Wheeler extended surface, armored type elements, made of cast iron gill type rings, shrunk upon steel tubes

High Pressure Economizer and Plate Type Air Heater Before the Closure Plates Were Put Around the Economizer — Note Connecting Headers



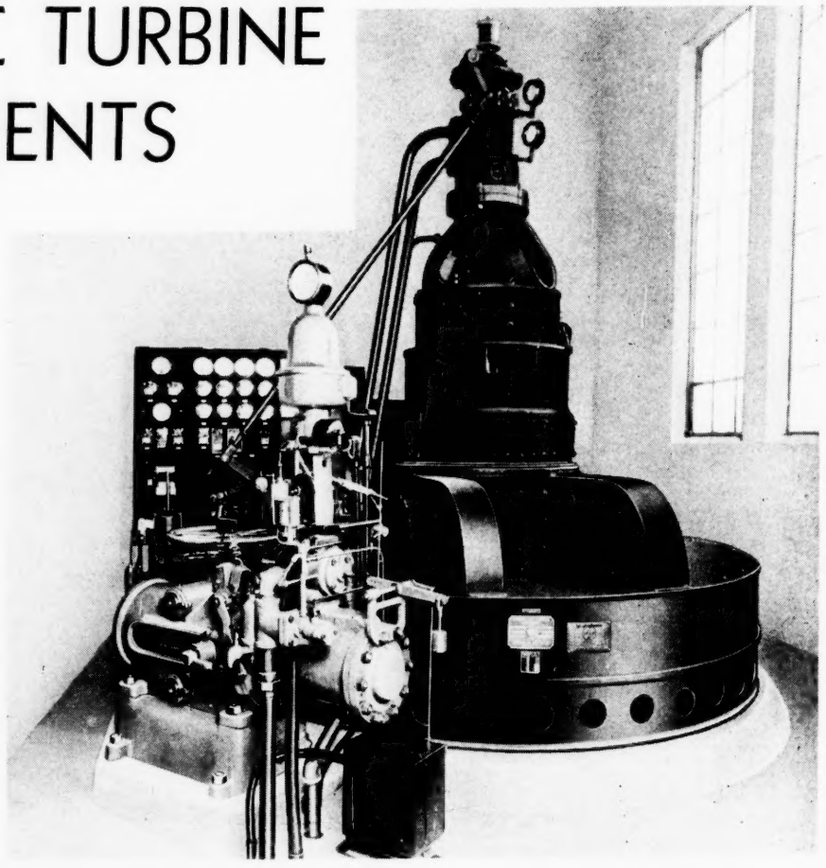
HYDRAULIC TURBINE IMPROVEMENTS

By

B. E. Smith

Secretary

S. Morgan Smith Company



Kaplan Hydraulic Turbine

Interior of the Lake Walk plant of the Texas Power & Light Company showing first automatically adjustable-blade Kaplan turbine installed in the United States. This unit develops 1900 horsepower at 277 r.p.m. under 33-ft. head

In recent years there have been a number of important improvements in the design and manufacture of hydraulic turbines which are of interest to all power users. These advances have been the result of insistent demands by hydraulic engineers on the turbine designers for higher and higher efficiences and for equipment which would reduce the total cost of hydraulic power installations, particularly for low head developments.

The introduction, some years ago, of the fixed-blade propeller type runner with its high specific speed resulted in a considerable saving in the overall cost of hydro-electric developments, as it permitted the use of higher speed and consequently smaller generators, resulting in cheaper electrical equipment and and smaller power houses. The propeller type turbine as first introduced was limited to heads of 30 feet or less. The savings obtained with this type turbine were so important, however, that there was a demand on the manufacturers to extend its use to higher heads. After considerable experimental work, it was found possible to design runners of this type for higher heads and there are now many installations in operation under heads up to 65 feet and there are projects under consideration for installation of propeller type turbines under even higher heads.

There is one limitation of the fixed-blade turbine which has restricted its use even in the face of its large saving in total plant cost. This limitation is due to the fact that its efficiency characteristics are such that it attains maximum results only at nearly full load, and that its efficiency rapidly decreases at loads less than that at the point of efficiency. Therefore, its use has been restricted to hydro-electric plants where the load is such that the turbines can be operated close to best efficiency most of the time.

In the past few years the Kaplan adjustable-blade propeller type turbine has been developed which gives high part load efficiencies and economy in operating output where there is a variable stream flow or a variable load demand. Tests show that the automatically adjustable-blade turbine operates at over 90 per cent efficiency through more than 30 per cent of its load range and at more than 85 per cent efficiency through over 60 per cent of the range of output. This advantage is gained through the simultaneous adjusting of the runner blades and the wicket gates so as to maintain the best conditions of flow through the turbine throughout the entire range of output. This adjustment of the runner blades is maintained by a mechanism connected to the governor which controls the movement of the wicket gates which in turn control the admission of water to the turbine and so regulate its speed and power output.

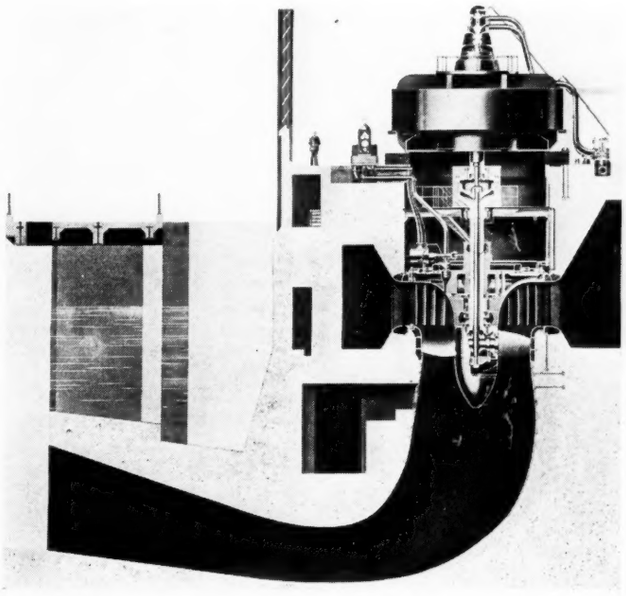
In addition to the high overall efficiencies obtained, the Kaplan turbine has other advantages. It is possible to operate the adjustable-blade turbine considerably above its normal rated capacity for short periods without appreciable loss in efficiency. It has a high output when operating under reduced heads and it is stable in operation at part loads. Due to its high unit capacity a smaller adjustable-blade than a fixed blade runner can be used to develop the same full load capacity and consequently it can be operated at a higher speed, thus permitting the use of a smaller and cheaper generator. It is also possible to reduce the number of units in a power house without sacrificing the overall efficiency by using Kaplan turbines. This use of fewer units results in material reductions in the cost of the mechanical and electrical equipment and also in reduced size and consequently in reduced cost of the power house itself.

While the Kaplan adjustable-blade turbine is more expensive than a fixed-blade turbine due to the additional mechanism required to operate the blades, this additional cost of the turbine equipment constitutes only a small percentage of the total cost of a hydro-electric development and it is more than offset by other savings and by the increased output obtained.

Considerable progress has been made in recent years in the development of the Francis or reaction type turbine. This progress has been mostly in the nature of refinements in details, as this type of turbine has been in general use for many years and there have been no

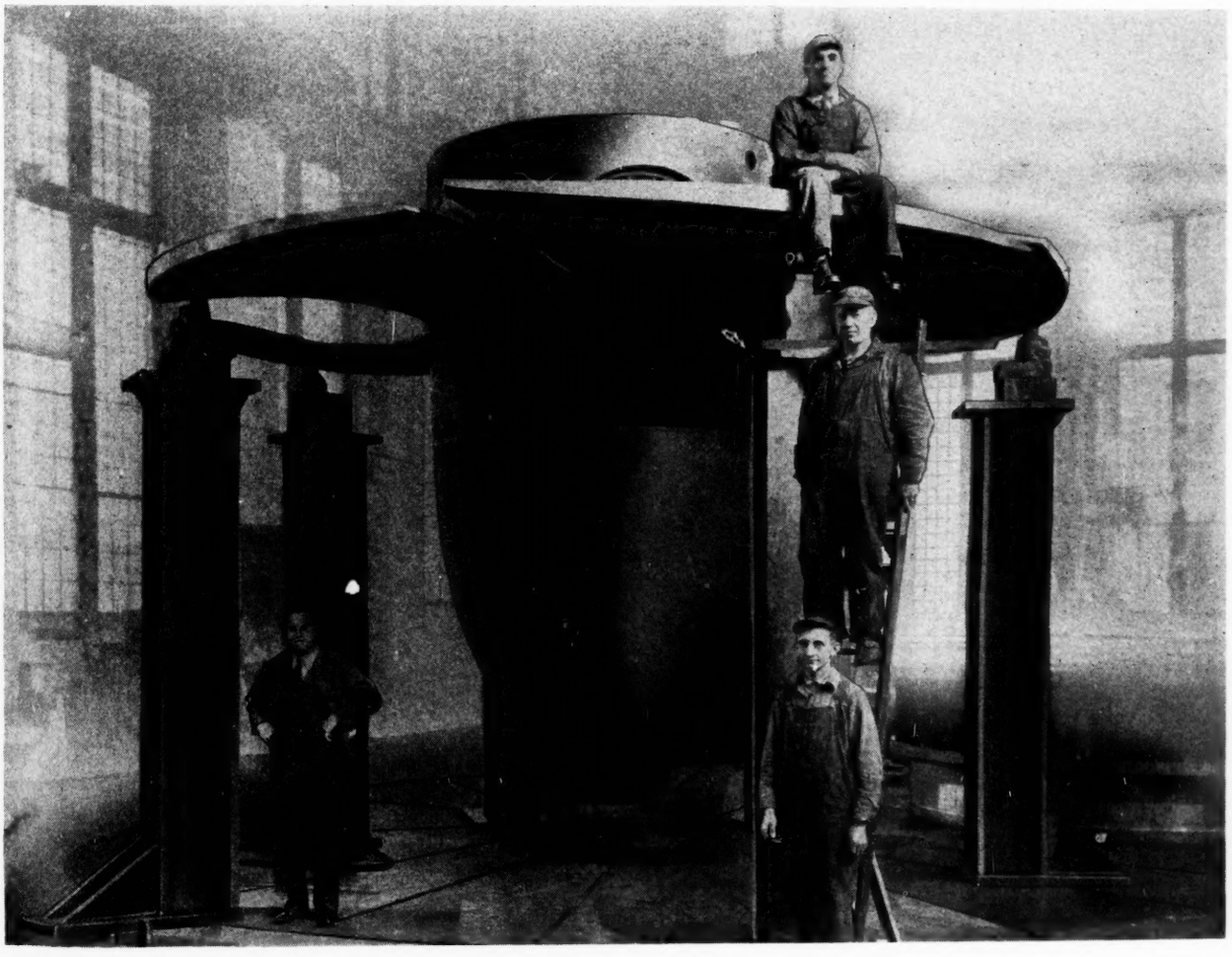
recent major changes made in the general design. New materials are being utilized, particularly non-corrosive steel alloys, for parts which were formerly subject to more rapid deterioration. Soft rubber linings are being used for water lubricated turbine guide bearings, as the rubber has been found to stand up longer and to prevent scouring of the shaft when the water carries considerable sand and silt in suspension. Central lubricating systems are being intalled which insure correct lubrication of all moving parts, many of which are rather inaccessible and which consequently are often neglected by the operators. Efficiencies have been improved through better design of runners and water passages and in some large installations efficiencies up to 94 per cent have been obtained in actual field tests.

Extensive research in the field of reaction turbines and their related structures such as penstocks, scroll cases, draft tubes, etc. are being steadily carried forward in the laboratories of the turbine manufacturers and new and valuable improvements are constantly being developed. This research by the manufacturers has been hampered in the past by the lack of sufficient funds due to the small margin of profit in turbine sales as the result of price cutting. Purchasers have begun to understand that it is folly to buy hydraulic turbine equipment on the basis of price alone and they now realize that, in order for the manufacturers to continue their research and experimental work, it is necessary for the turbine builders to have a fair margin of profit. Without this margin there will be no further improvements and there will be an increasing tendency toward poor design and construction, with details slighted or omitted to reduce costs, and with consequent decreased efficiency and increased maintenance costs.



General Cross Section of One of Safe Harbor Hydro Units

One of Six Kaplan Adjustable Blade Runners at Safe Harbor Plant Supplying Power to Maryland and District of Columbia



ADVANCES IN ELECTRICAL EQUIPMENT

MANUFACTURERS of electric generating and transmitting equipment have been unceasing in their efforts to develop new machinery and improve existing apparatus and designs to secure greater efficiency and reduce operating cost in the power field. Advantages of modern electrical equipment over installations of a comparatively few years ago in effecting savings in production cost are pronounced in many instances. For this reason it is important that manufacturers should give careful consideration to power requirements in any program for industrial rehabilitation and modernization.

While opportunities for development of heavy power machines of large capacities have been limited during the past year or so due to the decreased demand, some progress has been reported even in this line. Considerable attention has been given to the extension and rounding out of various lines of equipment. In connection with synchronous motors, generators, direct current, and induction motors, there has been considerable standardizing of these lines throughout the range for which they may be practically applied. An unusual amount of research and design work has been carried on in connection with such products as rectifiers, switchgear, transformers, railway electrification equipment, etc.

Large power transformers, distribution transformers, as well as instrument and metering transformers have been given particular attention. Inert gas equipment was furnished with a number of large transformers which also involved the introduction of a new type of equipment for tap changing under load. A line of distributing transformers for moderate voltage has been developed with surge proof characteristics or improvements, including principally the application of surge diverters.

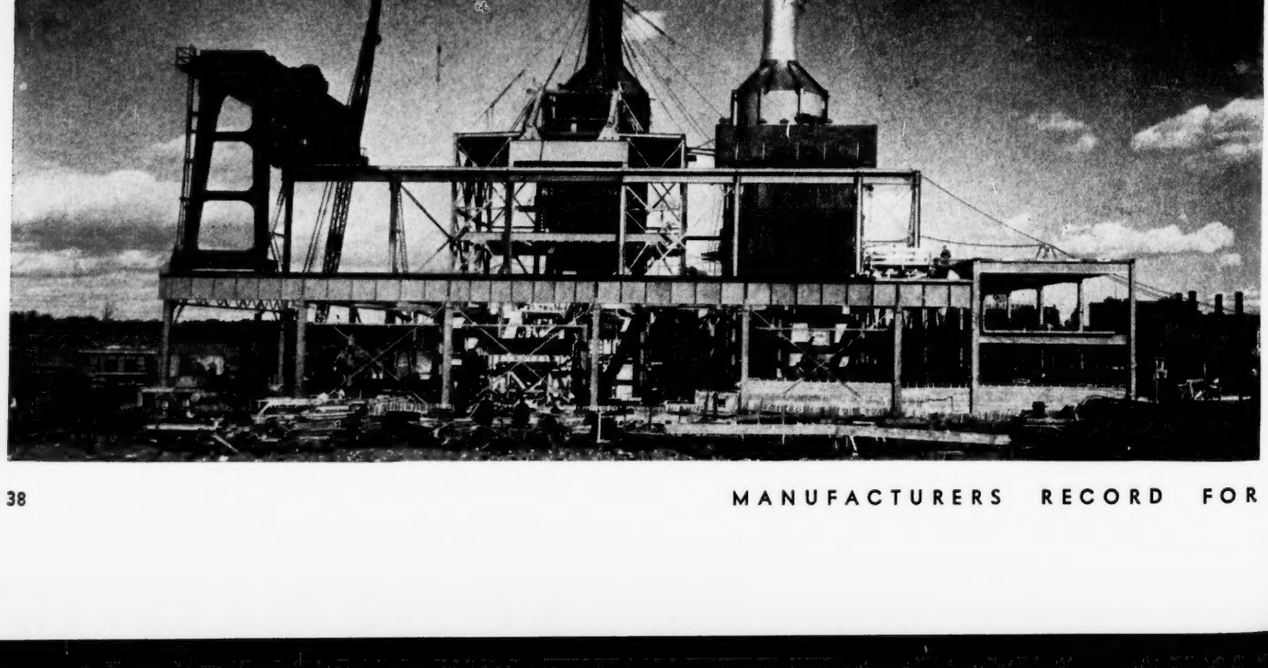
A line of especially designed motors for use in textile mills has unobstructed air passages and smooth surfaces of all parts to permit free travel of lint and dust through the motor. Within the last few weeks announcement was made of the development of a motor reduction unit for use where low speed drives are required. In this new equipment a standard round frame type motor is mounted directly on the gear reducer housing thus forming a compact unit. Helical gears are used which permits the highest possible efficiency and quiet operation.

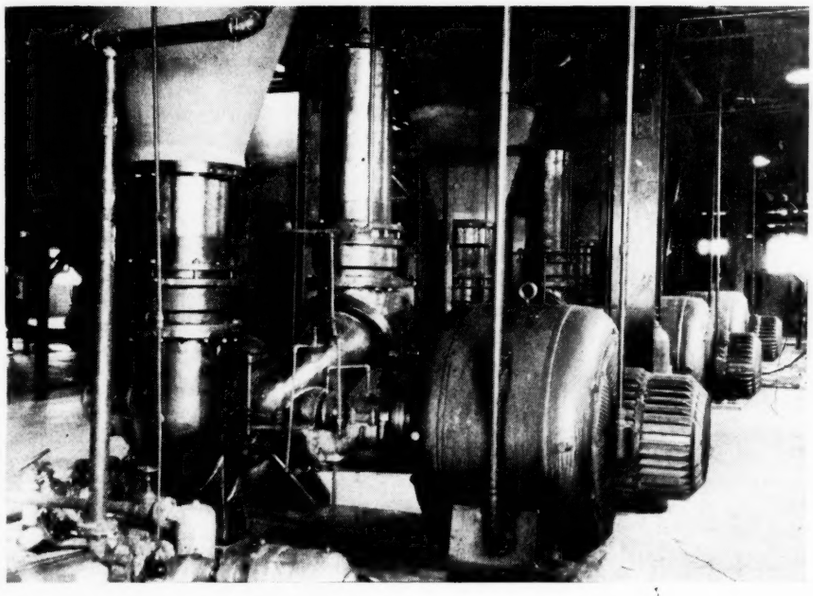
One of the newest developments in steam-electric generation is the first outdoor turbine-generator, a non-condensing set for the new power house of the Schenectady Works of the General Electric Company. This unit produces 6000 kilowatts by reducing the pressure of the 400 lb. steam in the mercury condenser boiler to the 250 lbs. used in the shops. The principal outdoor feature is a special lagging that covers the turbine casing and bearing brackets as well as the collector rings and exciter. The bearings are equipped with sight flow indicators located under windows in this lagging. The valve gear parts are all of non-corrosive material to withstand the effects of the weather.

The line of mechanical drive turbines has been extended and research work in testing materials continues. Welded construction has been used for certain stationary parts of steam and mercury turbines and extensively in the manufacture of the equipment for the Emmet Mercury-Vapor Process. The extensive use of X-ray inspection has resulted in the development of a welding technique to such a degree of perfection as to render this type of construction available for use in almost any type of service.

Steam generators operating at high speed and high temperatures are undergoing tests. One large unit of 150,000 kw. 1800 r.p.m. operates with steam conditions of 1200 lb. pressure and 825 deg. F. total temperature. Between the high and intermediate pressure elements the steam is reheated to 825 deg. total temperature. Work has been started on a 35,000 kw. 1800 r.p.m. unit for the Buzzard Point Station of the Potomac Electric Power Co., Washington. This unit will be built for steam pressure of 650

Outdoor Mercury-Steam-Electric Power Station for the Schenectady Works of the General Electric Co.





First synchronous motors of the fan-cooled type (Allis-Chalmers) were installed as part of the 15,000 horsepower electrical equipment of the Panama City, Fla., paper plant of the Southern Kraft Corporation

lb. gauge and due to the high total temperature of 825 deg. F. no reheat is required.

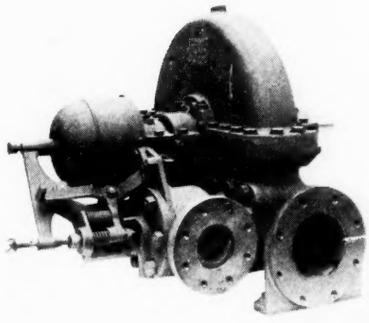
A notable change in structural design of motors was the development a few years ago of the fan-cooled type. One of the first large motor installations where enclosed fan-cooled motors were extensively used was in the paper plant of the Southern Kraft Corporation at Panama City, Fla. This installation was also outstanding on account of the complete electrical drive, involving nearly 15,000 horsepower in motor equipment.

A complete set of instruments for observing and recording the operation of a turbine-generator have been developed and installed on a 160,000 kw. unit. Modern turbines are so large and important that it is desirable to supplement the personal element in judging the operation of the unit with instruments that give both a remote indication and a permanent record of turbine performance. Among the instruments are an electric eccentricity recorder, an expansion recorder, and interference recorder for rotating parts that will indicate and record a squeek or other sound, a vibration amplifying recorder with detectors on each bearing, and Selsyn power amplifiers for the remote operation and indication of valves.

The use of synchronous motors for power station auxiliaries has been limited, partly because there is not a convenient way of varying their speed. This limitation is said to have been overcome on the induced draft fans for a steam boiler installation by coupling two synchronous motors of different operating speeds to the fans.

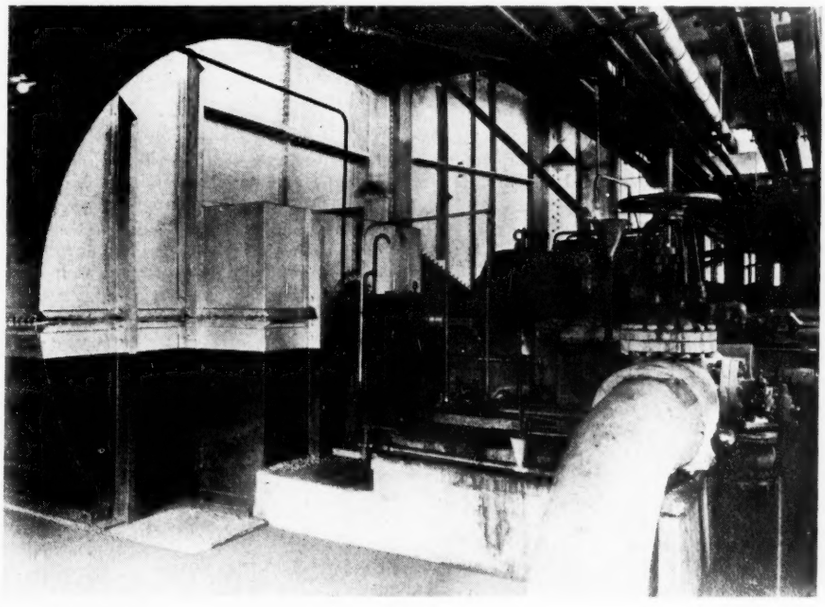
As an illustration of savings effected by modernization of power plants, the Pennsylvania Sugar Company has installed 15 new high pressure turbines which are said to have reduced steam costs to the amount of $1000 a day over the old plant. The difference between the costs of operation before and after the plant was replaced is sufficient to expect the new turbine installation to pay for itself in two years. The plant can be started without any external source of power, and constitutes one of the largest single installations of steam turbines operating at 150 lbs. back pressure in the country. The turbines receive steam at 400 lbs. pressure and 75 deg. superheat, and, exhausting at 150 lbs., supply steam for many processes throughout the plant.

Development of more efficient machinery as the result of many millions of dollars expended on exhaustive research and extensive tests, has enabled power producers and users to make huge savings. Many difficulties have been overcome in this work. Only recently has it been practicable to apply commercial surge tests to high voltage power transformers under operating conditions, and the new testing method, it is believed, will give fresh impetus toward testing standardization. Synchronous condensers are now being made in increasing sizes, one unit now being built is rated at 75,000 kv-a. Mercury arc rectifiers have been developed to a high point as the result of study and research during the past 30 years. Likewise improved switchgear and transformer units, tap changers, arresters, development of frequency regulation by automatic devices, fuses, meters, switchboards, distribution panels, instruments and various testing devices have all contributed to the greater efficiency of electric power with the result that operating costs are constantly being lowered.



General Electric Steam Turbine
Its line of mechanical drive turbines has been extended and is typical of units for ratings of 5 to 400 horsepower

A 730 horsepower Westinghouse turbine and reduction gear powering an induced draft fan in the new Pennsylvania Sugar Company steam plant



MORE GAS ENGINES IN USE

By

S. A. Lauver

WHEN natural gas was distributed throughout the State of Texas some years ago, only a short time elapsed before power consumers of that state realized that through the medium of natural gas engines they could obtain reliable power at low cost. As a result, the use of this method of power generation throughout Texas and some of the Middlewest states where natural gas is obtainable has increased markedly.

The same condition that applied to Texas some years ago now applies to the states of Louisiana, Mississippi, Alabama and Georgia where natural gas has only recently been generally distributed. The users of power in these states are beginning to wake up to the advantages held out to them by the use of modern equipment to meet their power requirements. Naturally this business is being developed at a rather slow rate at first, due to the fact that the average power user in this section has not been properly informed as to the advantages of the natural gas engine. It is rather interesting to note that the pioneers in the four states mentioned, in the use of such equipment, are generally the smaller type of consumer operating cotton gins, oil mills and small machine shops. At the present time smaller sizes of gas engines up to 50 horsepower are in the majority.

During the past year, however, many ice plants and ice cream plants in Georgia and Alabama have realized the saving that they can effect by using natural gas engines. As a result, it is reported some of the largest ice plants in the territory have placed their order with manufacturers and it is expected that they will have them in operation within a few months.

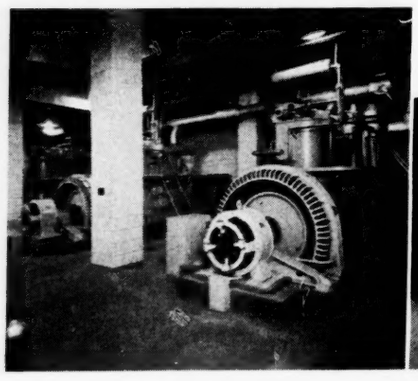
Users of gas engines in the South at the present time report a saving of from 50 to 75 per cent in their power generating cost. With this large saving the gas engine customer will find that it is possible to write off the initial cost of the installation in from two to five years. Recently one of the largest private estates near Atlanta, Georgia, installed two natural gas engines with a view to supplying the necessary water for general uses on the estate, and the owner expects to make a very large saving by the investment. In a number of cases in Alabama users of gas engines operating cotton gins have reported that the cost of ginning a bale of cotton by gas engine has dropped to as low as 15c per bale, and records of certain ice manufacturing plants show a cut in power cost of approximately 75 per cent. Within the next year it is predicted a large number of interesting and profitable gas engine installations of 100 horsepower and less will be made, and this doubtless will, within a very few years, result in the sale of much larger power generating units. These units represent not only direct mechanical drive, but direct connected gas engine-generator sets, installed with a view to furnishing electricity for individual and group drive in the larger mills.

Comparatively little effort has been made to date by representatives of gas engine manufacturers in this territory to sell or to push the sale of small gas engine electric units to be used for supplying electricity simply for lighting purposes. The indications are, however, that within a short time hotels and large department stores will undoubtedly become interested in this method of obtaining their illumination, as this has been done with eminent success in other parts of the country. The saving in the operation of lighting units is greater proportionately than in the strictly power units and therefore it is fair to suppose that after a few representative installations have been made throughout the territory that others will follow the lead of the pioneers.

The idea of direct gas power is nothing new and should properly be thought of as an accepted source of power. Over 45 years ago in Germany and France the internal combustion engine burning gas as a fuel was born, and over 40 years ago America produced the old type of "hot tube"—"hit and miss" gas engines which ran in those early days on artificial gas. The modern internal combustion engine has been developed to a high state of efficiency in design and construction. The Diesel gas, oil, the kerosene, the benzine, the gasoline engines are all internal combustion engines, depending upon the combustion of a gas within the cylinder or an oil spray which is converted to a gas during the combustion period.

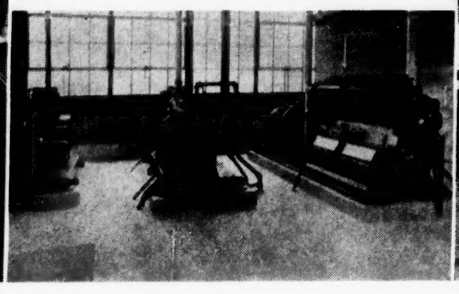
The great development of the internal combustion engine from the early days to the modern giants of today now in operation illustrates the advance in gas power. If we consider that 75 per cent of all gas power now used in the United States is natural gas and that all of this gas is pumped over vast areas of the country through a network of gigantic pipe lines by modern gas-driven compression pumps we gain a better idea of the importance of gas power. It is well to refresh our minds to the fact that there is no mystery or magic about gas power. Gas has 20,000 industrial uses, and only in comparatively recent years has natural gas been available over a wide territory to offer new opportunities for the generation of power at low cost.

Three 165-horsepower Bruce-McBeth gas engines in recently completed Dallas (Tex.) Gas Building

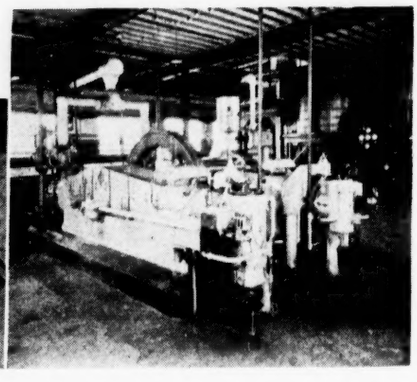


Auxiliary Equipment of Reform (Ala.) Compressor Station, Southern Natural Gas Corporation

300-horsepower Sterling gas engine direct connected to generator and 40-horsepower Buda gas engine driving air compressor



Cooper-Bessemer gas twin engine driving ammonia compressors and generator in Oklahoma City ice plant



THE ONE PRICE POLICY

By

W. F. Creighton, Sr.

THAT the dire effects of the present ruinous price competition in the construction industry is being recognized by the various groups, is shown by efforts which are being made to join together to work out through the Construction League, a method for correcting the condition. No progress was possible, so long as each group placed the blame on the other, but now that they admit mutual responsibility, it is hoped that some progress is possible.

Efforts of individuals to correct the trouble are of no avail. The general contractor, who does not arbitrarily cut prices quoted by subcontractors, material dealers, and manufacturers, and shop around for still lower prices if he secures the contract, is wasting time tendering a bid. He is invariably high. If he invites bids from the seller with the agreement that he will buy from the one who submits the lowest price, he is commended, patted on the back by all the sellers, and promised their rock bottom price, but the result is the same. His bid is not in the running, and he will learn later that the same firms who had promised their best prices, accepted the work from the successful bidder at a much lower one. Therefore, when an individual seller notifies the general contractor, and the world at large, that the price quoted is his best, the statement creates a smile of derision. Few subcontracts are let now at the first price quoted.

From the general contractors standpoint, the situation is not a happy one. The conservatives will not add to an already hazardous operation by bidding below known cost, and although some of the ones who are getting the work claim that it is profitable, the increase in bankruptcies discredits this statement. The increasing number of failures of producers, manufacturers, subcontractors, and reports that many others are in the hands of their bankers, show that no one may expect to exist long without a profit.

The first nationally known plan to correct the trouble was to require the general contractor to list in his bid, the subs he had used. This naturally failed, because it showed that the seller expected the buyer to protect him against his own foolhardy price cutting, and that they were not in mutual agreement on the one price policy.

In another section, all sub-bids are tabulated by a disinterested committee, and the general contractor is required to use the one selected. A serious objection to this plan, is that a subcontractor may not submit a lower price to one general contractor than to another, even though past experience has proven to him that he can execute his work cheaper under the one than the other; also, the general contractor is deprived of the right to select a sub whom he prefers for satisfactory reasons.

In another section, the architects are taking the lead in enforcing a plan, which consists primarily of taking the purchasing of a large part of the work out of the general contractor's hands, and putting it in the hands of the owner. To general contractors, who have worked on cost-plus work, where an owner is consulted in the buying of subcontracts and materials, this plan seems doomed to fail, because they know that the owner will go further in peddling bids and shopping for lower ones than the general contractor.

In another section, a plan has been working satisfactorily for several months. Unfortunately, the small amount of work offered has prevented it from being given a fair trial; but the writer believes that so far, it is the best plan brought to his attention. The subcontractors are organized, and require the general contractor to submit to their secretary, a sealed list of the sub-bids used in the general contractor's price. When the contract is awarded, the list submitted by the successful bidder, is made public, and the work goes to the firm whose name he has submitted. The list is returned to the unsuccessful bidders, unopened. The architect and owner have nothing to do with the operation of this plan, except the architect's usual right of veto of any sub whom he considers unsatisfactory; the general contractor is enabled to pick out the sub he prefers, and nothing prevents a subcontractor from giving one general contractor a lower price than another, because the prices are never made public. The result of the operation of this plan, has been that general contractors, realizing that they cannot make a profit trading for lower bids, have again begun to add a profit to their price, and the subcontractors do not ask an excessive price, with the expectation of cutting it later, because they know that they will have no opportunity to do so.

The Construction League is watching the operation of these plans, and others, which are being tried out in other parts of the country, with the hope that time will show which is best, or possibly a modification of several, will prove worthy of national recognition.

It must be remembered that the construction industry is widely scattered, and that its units are individualists, unaccustomed to banding together for mutual protection; also, that it is difficult to overcome the hatreds, jealousies, and mutual distrust, engendered by years of competition; also, that the immutable law of supply and demand is responsible for low prices. But, it does not seem unreasonable to hope, that the subcontractors and manufacturers can agree on a plan which will enforce the one price policy, if the general contractors, through their associations in the A. G. C. have been enabled to do so, in a large part of the country. Many think that this condition is due to the assistance of the architect, and while this is true in many cases, it would never have reached its present satisfactory situation, unless the general contractors themselves, had become convinced of its importance, and were willing to lose a job, rather than meet the price of a competitor, who had submitted a lower one.

Mr. Creighton, of the Foster & Creighton Company, General Contractors, Nashville, Tenn., Is Chairman of a Special Committee Investigating Below Cost Price-Cutting and Bid-Peddling Practices for the Construction League of the United States, the Covering Organization for all Groups of the Construction Industry

SOUTHERN CONSTRUCTION AWARDS $387,552,000 FOR ELEVEN MONTHS

CONTRACTS awarded for building, engineering and construction projects in the Southern States aggregated $387,552,000 in value during the first 11 months of 1932. This total is compiled from reports published in the DAILY CONSTRUCTION BULLETIN of the MANUFACTURERS RECORD, and covers only those jobs for which cost figures are available and excludes hundreds of residential contracts amounting to less than $10,000 each. Including all lettings, it is conservatively estimated that from January 1 to December 1 the construction program in the South involves an expenditure of close to $500,000,000.

In the first 11 months of last year construction awards in the South had a total value of $621,931,000, not including residential building jobs under $10,000 each, or projects for which no cost figures were available.

In October, a new high monthly record for this year was established, when a total contract valuation of $55,691,000 was recorded. Awards in September this year amounted to $47,485,000.

While November awards of $29,227,000 represent a sharp decline from the peak reached in the previous October, they exceed in value the amount of the contracts let in November, 1931, and they are well above the December, 1931, lettings which were $27,381,000.

The initiation of work on projects just let to contract will mean that early next year there will be under way a sizable construction program in advance of the launching of work on new 1933 undertakings.

Industrial and engineering projects, including a variety of undertakings such as dredging, industrial plants, levees, revetments, dikes, filling stations, garages, warehouses, sewers, drainage and waterworks constitute the principal November awards amounting in the aggregate to $10,037,000.

During October, the various governmental departments let contracts with a total value of $5,727,000 for dredging in harbors and inland waterways, whereas awards for similar projects in November totaled but $1,293,000. Also, an unprecedented volume of levee, revetment and dike construction was put under way in October which called for a total expenditure of $19,022,000, compared with November expenditures for similar work amounting to $4,657,000.

Awards for new industrial plants and extensions to established industries last month rose to $2,247,000, compared with $1,493,000, representing the value of similar lettings in October. That manufacturers are taking advantage of the low prevailing prices for materials and equipment to go forward with plant rehabilitation programs so that they may be in a position to promptly fill orders once a turn in business arrives, is definitely indicated by the diversity of lines represented, although few outstanding new plants were reported as making up the gain over the previous month's total.

A $500,000 steel mill for Follansbee, W. Va., was the outstanding industrial award of November. The Sylvania Industrial Corporation started work on an expansion program at its Fredericksburg, Va., plant for the production of transparent waterproof paper. A number of textile mills placed orders for new machinery, awarded contracts for additions and started work on new units. The oil industry continues to make strides through the modernization of existing plants, with a view to installing equipment that will cut production costs. Included in last month's industrial awards were the following enterprises:

Packing plant, box factory, furniture plant, garment and shirt factories, cotton compress, gas compressor station, grain elevator, printing plant, creamery and radio station.

Encouragement is to be gathered from a consideration of the total in November of $7,425,000 representing projected industrial and engineering enterprises. The Chesapeake & Ohio Railway Company proposes to round out its tunnel building program by a further expenditure of $2,500,000. A $350,000 sodium sulphate plant is planned at Monahans, Texas. Extensions proposed for a Fort Worth, Texas, refinery call for an expenditure of $700,000. A power plant project at St. Louis, Mo., involves an investment of $500,000. A $300,000 refinery is contemplated at Big Springs, Texas. Included in the long list of proposed industrial enterprises are the following:

Coal mine, cold storage plant, bakery, cotton gin, peanut plant, fertilizer factory, truck terminal, clothing plant, barrel heading mill, silk mill, shirt factory, bulk oil storage plant, publishing house, tobacco factory, ice cream plant and a garment factory.

Levees, revetments and dikes, for which awards were made in November, will cost $4,657,000. This class of work centers largely on the Mississippi River and its tributaries. One outstanding project, besides the Mississippi work, is in the Florida Everglades, calling for a total expenditure of $9,000,000 for the control of Lake Okeechobee. This class of work is being pushed by the government. Construction plants are owned and operated by the various Engineer Corps offices and by private contractors. They use a wide variety of equipment, running the gamut from small earth-moving units, such as scrapers pulled by the smallest type tractors, or even mules, to the largest type suction dredges.

Awards totalling $8,176,000 for public buildings by Federal and local governments indicates the trend of this class of new government work to get under way in the South in November.

CONSTRUCTION ACTIVITY FOR NOVEMBER, 1932

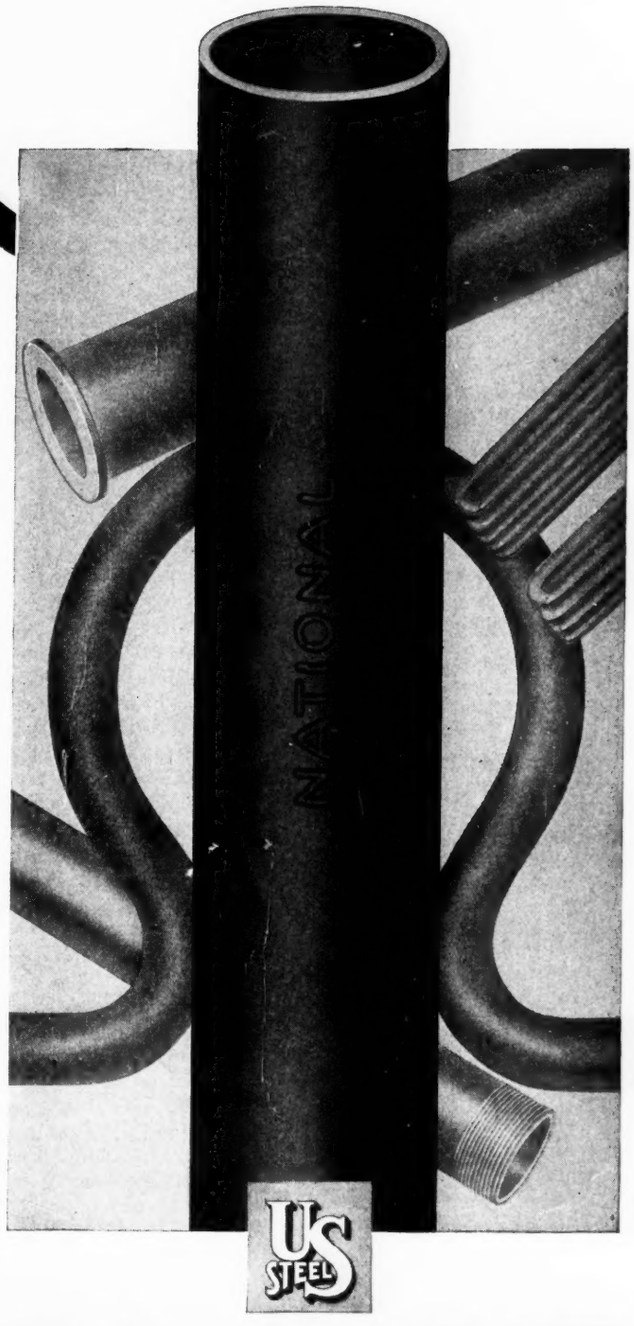
	Contracts Awarded	Contracts to be Awarded
General Building		
Apartment houses and hotels	$225,000	$95,000
Association and fraternal	44,000	25,000
Bank and office	60,000	242,000
Church	115,000	465,000
Dwellings	597,000	310,000
Stores	130,000	240,000
Total	**$1,171,000**	**$1,377,000**
Public Buildings		
City, County, Government and State	8,176,000	3,102,000
School	469,000	1,881,000
Total	**$8,645,000**	**$4,983,000**
Roads, Streets and Paving	**9,978,000**	**19,285,000**
Industrial and Engineering Projects		
Dredging	1,293,000	2,497,000
Filling stations, garages, etc.	90,000	230,000
Industrial plants	2,247,000	7,425,000
Levees, revetments, dikes, etc.	4,657,000	2,633,000
Warehouses	312,000	25,000
Sewers, drainage and water works	432,000	2,779,000
Miscellaneous projects	1,006,000	35,924,000
Total	**$10,037,000**	**$51,513,000**
Grand Total	**$29,831,000**	**$77,158,000**

STRENGTH

is only

ONE

of its advantages



IN any case where pressures, vibration, and varying temperatures must be endured by a piping system, strength is indispensable, of course; but strength is not all that is to be considered. Workability is likewise important, where the pipe must stand bending, flanging and coiling.

Corrosion resistance is of undeniable importance, for it will be the measure of strength or life of the pipe as time passes. Adaptability to any form of joint making is a highly desirable quality. A complete range of sizes and wall-thicknesses to meet a wide range of requirements is also of decided value, while the satisfaction that comes from the assurance that each and every length is uniform, thoroughly tested, has passed a rigid inspection and conforms to recognized standard specifications is an advantage that is too important to be overlooked in any piping job.

Experienced users of pipe everywhere recognize these advantages as inherent in NATIONAL Pipe —advantages that have made it—

America's Standard Wrought Pipe

NATIONAL TUBE COMPANY · Pittsburgh, Pa.
Subsidiary of United States Steel Corporation

NATIONAL PIPE

WELDED OR SEAMLESS

IRON, STEEL AND METAL MARKET

Steel Production Keeps Above Mid-Summer Level

Pittsburgh—[Special.]—Steel demand was somewhat lighter in November than in October but was still well above that in July and August. As buying is almost wholly for very prompt shipment, production follows demand closely, and furnishes a precise measure. Production of ingots, relative to total capacity, has been reported as follows: May, 19.67 per cent; June, 15.96 per cent; July, 14.66 per cent; August, 14.26 per cent; September, 17.34 per cent; October, 19 per cent. Thus in October nearly all the loss after May was regained. November may be estimated at somewhat nearer 17 than 18 per cent.

After the low point was passed in August, demand in numerous quarters increased markedly up to the middle of October and then a little slackening was observed, attributed to some buyers postponing decisions until after the election, and these buyers have not as yet entered the market.

The appearance of the steel market is one of greater dullness than is indicated by the tonnage actually made and shipped. No improvement is expected in December as it has always been a dull month unless a strong upward movement was already in progress when the month began. This year improvement began in satisfactory manner but once interrupted it showed no signs of resumption.

The steel trade has less hopeful views of the nearby future than seems warranted by circumstances. Seasonal improvement beginning immediately after the turn of the year has been the rule and has been seen in each of the past three years of depression, being very marked in 1930 and 1931 with a peak production about one-half over the rate of the preceding December. In active times this seasonal improvement has run through March, and March is the month the steel trade has always regarded as the favorite month for the beginning of real emergence from a depression.

The only increase in steel demand has been with the automobile trade and it is a small increase. October was the low month for many years in automobile production and it is assured that the report for November will show at least a small increase, while December is held certain to do somewhat better.

Coal and Coke Demand Improved

Birmingham. — [Special.]—Confidence is expressed in the Birmingham district that there will be considerable business placed, not all for immediate production and delivery, however.

With the exception of coal, coke and one or two other items, the past month's review shows a little slipping. There was not active steelmaking pace maintained during the month. Larger machine shops completed some interesting work and shipments are being made. Several fabricating shops report that they have a little unfilled tonnage, waiting on contractors to get preliminary work done so that the placing of steel will be possible.

Cooler weather had considerable effect on the domestic coal requirements. There was improvement in the needs for steam coal, throughout the district. The last month of the year will see further improvement. Quite a number of mining projects without railway transportation, termed "wagon mines" are now active in Alabama. During the past month or so, "wagon mines" were developed in counties outside of those which for years have been designated as coal producing sections, for instance, in the Boaz and Guntersville sections.

The coke industry also enjoyed improvement in conditions the past month and there is promise of continuation of this condition. Alabama coke is finding its way into other states, both metallurgical coke and fuel product.

The Portland cement industry felt a slight increase in production and a fairly good start on increased demand by reason of road construction and paving. The present month will see much road work done in Alabama and reports from Georgia, Mississippi and elsewhere are encouraging as to a similar move. Federal financing is making it possible for this class of development and the Birmingham district is in position to furnish much material, slag, reinforcing concrete steel and cement.

Cast iron pressure pipe shops were disappointed at the slow recuperation during the past month but hope is expressed still that throughout the country there is need for development in water and sewerage work and that pipe, the essential product in such development, will be ordered in quantity in the near future.

Zinc Price Advanced

New York—[Special.]—The average price for the non-ferrous metals was lower at the end of the past month than at the beginning. The copper market made a net drop of ⅛c per pound for the month, returning to the all-time low of 5⅛c. Tin lost 2c per pound. Silver declined 1½c per ounce, reaching 24¼c, a new all-time low. The price of zinc was the exception to the general trend, the price at the month's end being $2 per ton above that at the start. Lead was the only metal to be at the same level, though at one time it was $3 per ton higher than at either the start or the close of the month.

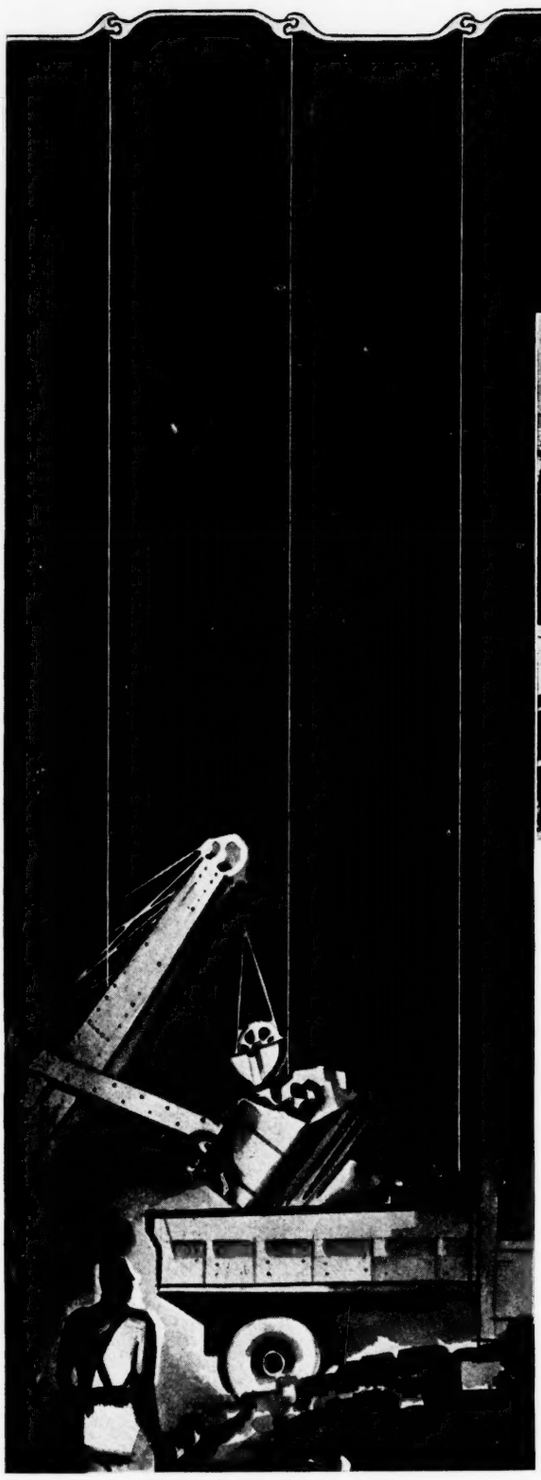
From the standpoint of sales November was a dull month, with sales less than in October and with September standing out as the briskest month during the second half of the year. Most of the metal price declines took place late in the month and were due largely to influences outside of the metals industry, such as the decline in sterling exchange and the uncertainty regarding payment of international debts.

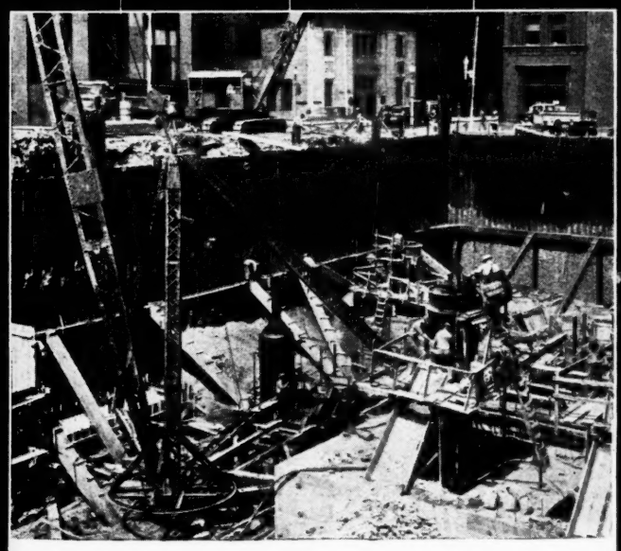
Statistics of the metal industry were fairly satisfactory but were not as uniformly good as early in the fall. The trouble has been that many idle mining and smelting properties were restarted to give needed employment and without regard to the economic conditions concerned with supply and demand. The most favorable statistics have been among the Tri-State producers centering at Joplin, Mo., where supplies have been constantly shrinking and are the lowest in many months. This has had the favorable effect of stiffening prices for both lead and zinc ores.

Consumption of metals on the part of the automobile industry was on the increase last month, which was therefore contrary to the general trend. Nonferrous metals find increasing use in automobiles for both decorative and useful purposes. The amount of zinc used in a car today is triple that used ten years ago. Chromium, nickle and aluminum are also metals which have become more popular, the tendency being to use lighter metals and those which will resist corrosion.

Perhaps the most important event of the month in the metals industry was the holding of conferences of world producers to try to arrange to keep production down to 20 per cent of capacity.

WALLS OF STEEL





Carnegie Steel Sheet Piling in foundation of Gulf Building, Pittsburgh

FOR all types of foundation work, particularly where adjoining foundations and streets must be protected, walls of steel sheet piling are highly efficient. A wealth of experience in the use of piling makes the services of Carnegie engineers of real value to you in the solution of your problems. Feel free to take advantage of their services.

CARNEGIE Steel Sheet PILING

Product of CARNEGIE STEEL COMPANY, Pittsburgh, Pa., *Subsidiary of United States Steel Corporation*

207

GOOD ROADS AND MOTOR TRANSPORT

$21,225,000 For Highways

Four Southwestern States to Expend That Sum This Winter

Fort Worth, Tex.—Before winter begins in the Southwest, thousands of men will be put to work in road construction activities, according to C. E. Swain, Federal district engineer for the four states of Arkansas, Louisiana, Oklahoma and Texas. After conferences with the several highway commissions, Mr. Swain declares that these states will expend approximately $21,225,000 in Federal aid road construction. Minimum wages will be set by the highway commission of each state, but in no case will a working week exceed 30 hours, and a maximum amount of hand labor is to be employed.

$1,775,000 for Mississippi Road Work

Jackson, Miss.—The State Highway Department announces another major letting of contracts under the state's Federal relief road program, which will involve the construction of six projects estimated to cost $775,000, bids to be opened December 13. Construction will embrace 37 miles of road work, including 16.1 miles of paving and the construction of a number of bridges. On December 14 the Department will consider heavy purchases of supplies, buying for the first time on a yearly basis and expending about $1,000,000. With the December letting, the Department will have allotted approximately $3,500,000 of a $4,200,000 program made up of Federal emergency relief funds matched by Federal aid.

Would Expand Roads System

Oklahoma City, Okla.—An objective of the Oklahoma Good Roads Association is the expansion of the state's major highway system until it embraces 10,000 miles, according to W. O. Woodan, Okmulgee, president. Among other features of the association's program, it is provided that a survey be made of at least 2000 miles of the state's improved roads each year to determine where maintenance and construction funds may best be expended, the surveys to begin each June and the following year's expenditures based largely on them.

Dividends From Improved Roads

By

E. E. Duffy
Chicago, Ill.

It isn't all outgo when the motorist pays his license fee and gasoline tax.

Authoritative statements from various state highway departments say that the motorist comes out on the long end of the deal. The building of improved roads, it is shown, reduces car operating costs and from that one point alone the motorist gets back more than he pays out.

The State Highway Commission of Missouri declares that the average motorist in that state is saved $30 a year over and above his license fee and gas tax payments. On that basis the roads on the Missouri state system, which includes 3100 miles of concrete, are returning $22,500,000 a year to the state's road users. The total saving during the last eleven years, after deducting all tax costs, is held at $100,000,000.

Although California is humorously thought of as a state of somewhat extravagant claims, there is no exaggeration in the state's announcement that her good highways, up to the middle of 1930, saved $54,000,000 to motorists.

Frank T. Sheets, chief engineer of the Illinois State Highway Department, relates that Illinois' state highway system, nearly all concrete paved, reduces car operating costs $73,000,000 a year. This is $25,000,000 more than motor car users pay out in taxes.

Such facts as these compose irrefutable evidence that highways are self-supporting, road authorities claim. The large savings due to good roads lift highways out of the class of most government activities in that the individual is directly benefited. There is a growing recognition that the license fees as well as the gasoline tax is not a tax in the ordinary sense, but rather a charge for service.

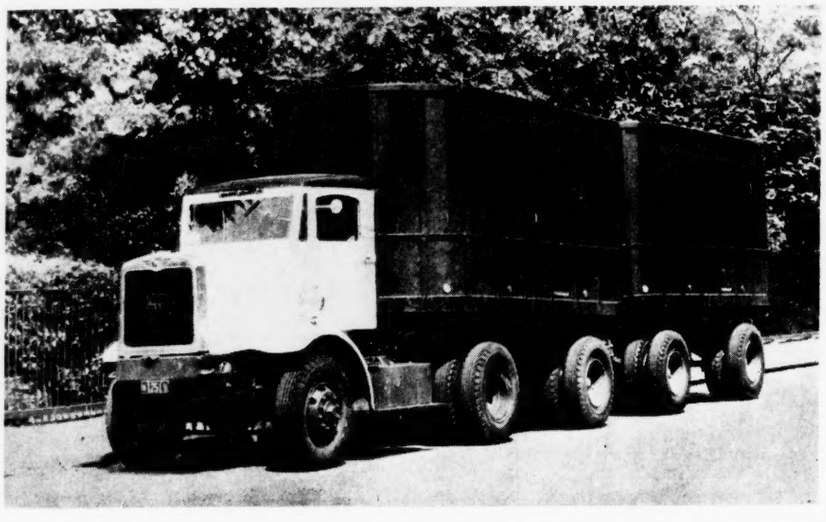
72,000 Pound Tractor Truck

A 72,000-pound gross load tractor truck, designed to meet the requirements for a compact, heavy-duty transportation unit, is the newest product of the Four Wheel Drive Auto Company, Clintonville, Wis.

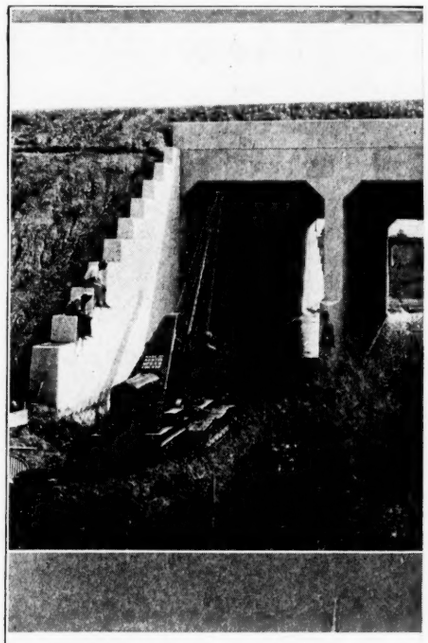
This unit is to meet the trend in highway regulation, which restricts the length and axle weight of tractor and trailer units; the FWD is claimed to be able to haul greater payloads in twenty-three states and two Canadian provinces without exceeding the load per axle limit. The manufacturer states that in a typical installation the new tractor-truck carries a gross of 23,760 pounds, distributed 7950 pounds on the front axle and 15,810 pounds on the rear axle.

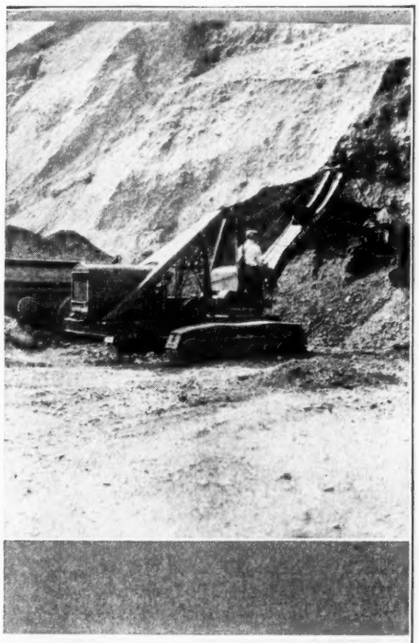
This addition to the FWD line offers one of the outstanding developments for 1933. It is a powerful unit, combining a very short overall length with equal weight distribution and four-wheel traction. The standard wheelbase is 120 inches.

Heavy-Duty Tractor-Truck of Four-Wheel Drive Type



A GENERAL UTILITY MACHINE





Quickly Convertible to Shovel, Crane, Dragline or Trench Hoe

Designed with a view to ease of convertibility in the field, the AUSTIN Badger is the ideal general utility machine. Conversion from shovel to dragline or trench hoe is just a matter of minutes and the same is true of mounting and demounting from the special wheel mounts.

The AUSTIN Badger and all of its accessory parts were designed by an "old-timer," one of the originators of the small shovel idea, who has built into it all of the ideas gained in his many years in the field, installing and operating equipment of this kind.

The use of anti-friction bearings throughout, the added dipper capacity, the greater digging reach and dumping height, the low center of gravity and wide crawler treads—these and innumerable other exclusive Badger features are the result of years of field study.

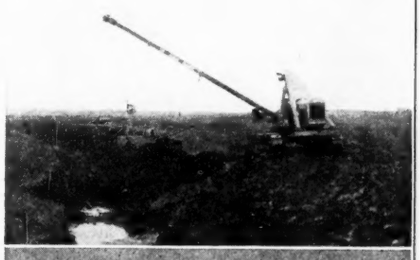
This "built-in knowledge of user requirements" accounts for the fact that more AUSTIN Badgers have been purchased during 1932 than any other shovel in its class.

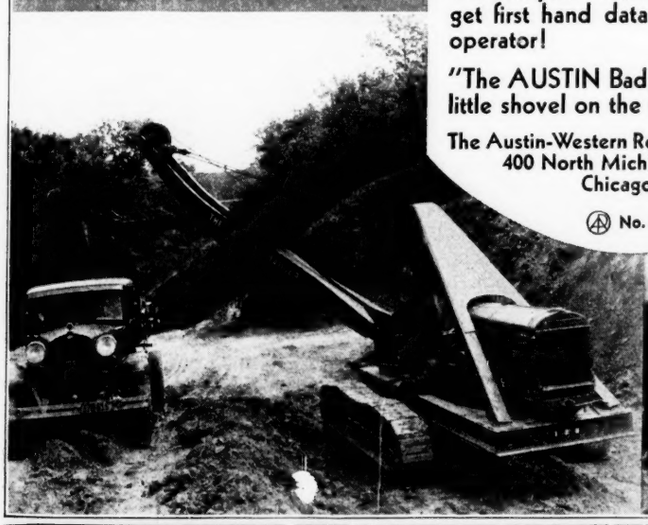
Write today for complete details on the AUSTIN Badger and names of users in your vicinity so that you can get first hand data direct from the operator!

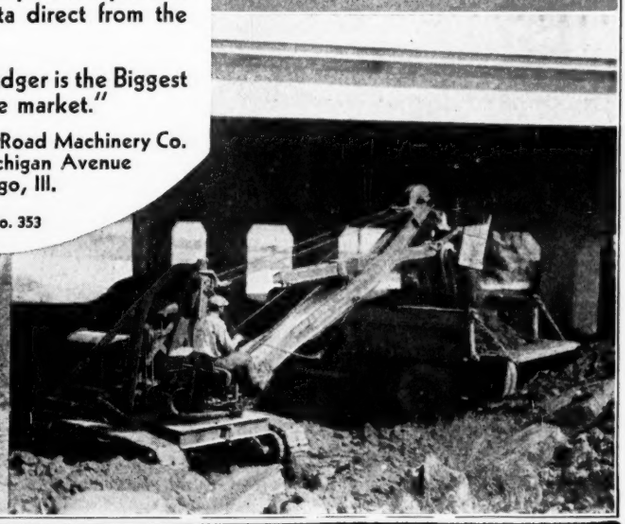
"The AUSTIN Badger is the Biggest little shovel on the market."

The Austin-Western Road Machinery Co.
400 North Michigan Avenue
Chicago, Ill.

No. 353







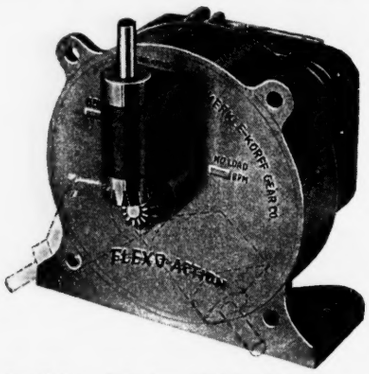
The Austin-Western ROAD MACHINERY CO.

ROAD ROLLERS, CRUSHING & SCREENING PLANTS, SCARIFIERS, SWEEPERS & SPRINKLERS, ROAD GRADERS, ELEVATING GRADERS. MOTOR GRADERS, PLOWS & SCRAPERS, BITUMINOUS DISTRIBUTORS DRAGS, SHOVELS & CRANES, DUMP WAGONS, SNOW PLOWS.

EQUIPMENT NEW AND IMPROVED

Gear Speed Reducer With Integral Drive

The Merkle-Korff Gear Company, Chicago, Ill., has placed on the market a small speed reduction unit with an enclosed motor drive. It has a wide range of application, due to its compactness and the fact that it may easily be adapted to almost any service or mechanism. Its overall dimensions are: height, 3⅛ inches, width, 3⅛ inches, and depth, 2⅜ inches. The unit may be supplied for almost any speed required, from motor speed of 3000 r.p.m. downward, and may be obtained for either clockwise or counter-clockwise rotations. Both horizontal and right angle drives can be furnished, the latter being available with the output shaft in any position around the 360 degree circle. An induction motor (of the shaded pole type) or a synchronous motor is provided, or where required, a universal motor for D. C. applications. Gear housing is neatly designed and gears run in grease sealed in, thus assuring positive lubrication and quiet operation.



Small Speed Reducer With Wide Range of Applications

New Coal Stove

At the recent meeting in Hazleton, Pa., of the American Institute of Mining and Metallurgical Engineers, an anthracite-burning kitchen range developed by the research department of the Jeddo-Highland Coal Company, Jeddo, Pa., was demonstrated. This new stove, revolutionary in design, in addition to furnishing heat for cooking, is capable of heating a six-room house, humidifying the air and supplying hot water. A feature of the stove is that it has two fire boxes with electrically operated forced drafts for quick starting, both boxes being connected with the heating system.

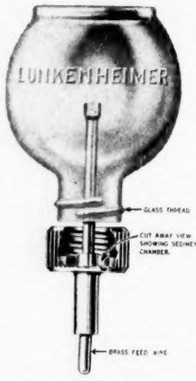
Armstrong Products at Power Show

Three new products developed by the Armstrong Cork and Insulation Company, Lancaster, Pa., are exhibited at the Tenth National Exposition of Power and Mechanical Engineering in New York City. One is a new type of brick designed for direct exposure and heat reflection, which permits quick heating and elimination of heat storage. It is said to be especially suitable for electric furnaces or any type of furnace construction where abrasion from the movement of ware or impingement of gaseous or oil fuel is not a major factor.

Another new Armstrong product is an improved type of cork covering for cold pipes, which is claimed to be of high efficiency, due to greatly lowered density which, itself, is achieved by a new process of manufacture, in which the cork granules are knit more closely together. Conductivity is lowered, it is said, and the strength of the covering increased.

There will also be exhibited a new type of corkboard for cold storage rooms, known as Super-Service Corkboard. It is coated on both surfaces at the factory with a special mastic compound applied mechanically under pressure. According to Armstrong engineers, this sealed corkboard provides an effective weapon against the twin menace of air and moisture infiltration.

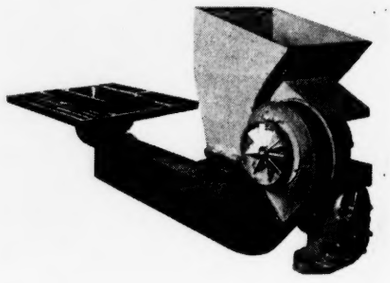
Lunkenheimer Bottle Oiler



Of new design and made up of three major parts, a new Bottle Oiler is being marketed by the Lunkenheimer Co., Cincinnati, Ohio. These three parts consist of a glass bottle with threaded neck, bronze base with integral sleeve type shank and brass feed wire. A thick resilient cork washer seals the joint between the bottle and base. This type of oiler is claimed to supply the correct amount of oil for the most efficient and economical lubrication of plain bearings, operating automatically and feeding only when the shaft is in motion. As the supply is always visible, it affords a method of plain bearing lubrication that is almost fool-proof.

McBurney Automatic Underfeed Stoker

Made in a range of sizes from 25 to 250 horsepower boiler rating and adaptable to all heating and power boilers within this range, a new McBurney Automatic Underfeed Stoker has been introduced by McBurney Stoker & Equipment Company, Atlanta, Ga. Several improvements have been embodied in this stoker, including sectional construction of the retort, tuyeres and dead plates to permit easy and economical repairs and a non-clogging and non-overloading coal feed screw. The fan is equipped with a "Vortex" capacity control on the inlet which is said to greatly increase the efficiency of the fan at partial loads. The stoker is designed for hard, continuous plant service.



Designed for Hard Service

High Wattage Bi-Post Lamp

Regarded as the most radical departure from traditional design since Edison's invention of the first successful incandescent lamp, a new 1000-watt bi-post lamp has been developed by the Nela Park Lamp Development Laboratory of General Electric Company at Cleveland, Ohio. This new bi-post high wattage lamp dispenses with the customary base and uses instead two copper prongs to which a heat-resisting glass cup is sealed. Internal construction is built up from these prongs, and the bulb sealed to the glass cup as the final operation. Because of their simpler design and construction, the new lamps are more rugged than former types, beside being lighter and smaller and inherently prefocusing. They will be used in the new 19,000 miles of government-lighted airways and in motion picture studio work.

WIND **and** SPIN
a top in the dark IF YOU LIKE

MODERN INDUSTRY DEMANDS COOPER HEWITT LIGHTING

SPINNING yarn, of course, is an infinitely more complicated operation than spinning a top—yet the quantity and quality of illumination needed for the former too often gets about as much consideration as does that needed for the latter.

Yet, particularly in the setting-up and operation of spinners, spoolers and warpers, operatives must see with exceptional clearness and accuracy if finished yarn is to be as free as possible from slugs, thin places, singlings, doublings and other imperfections.

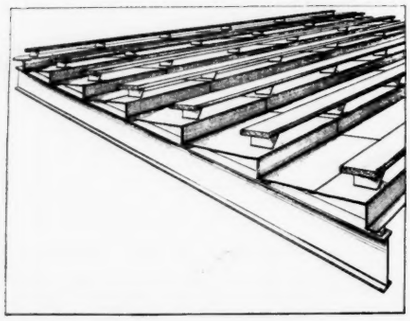
Cooper Hewitt light pays for itself many times over in helping to correct all these deficiencies. In creeling, piecing up ends, doffing, oiling, banding, draft and gear twist changing, putting on new travellers—every stage of spinning—this extraordinary illuminant increases efficiency, speeds production, reduces spoilage, adds to profits.

Let us *prove* this—put in a few Cooper Hewitts for a 30-day trial. General Electric Vapor Lamp Company, 819 Adams Street, Hoboken, N. J.

BETTER THAN DAYLIGHT

GENERAL ELECTRIC
VAPOR LAMP COMPANY

541 Copr. 1932, General Electric Vapor Lamp Co.



Cross Section of Ingalls Shielded Arc Welded Steel Stadium

Ingalls All-Steel Stadium

The Ingalls Iron Works Company, Birmingham, Ala., has developed a new type of all-steel stadium or grandstand, in which seams have been reduced to a minimum and all seams electrically welded by the latest shielded arc process. This new type of construction is claimed to afford great strength with light weight; is economical and watertight. It requires no frequent and expensive repairs, as there is no cracking or disintegration under changing weather conditions. Short steel plate stools supporting wood planks form the seats on each tread. In construction, it is flexible and may be used in any locality or site, while the weatherproof space under the structure may be used for the construction of class rooms, club rooms, gymnasiums, auditoriums, etc. Construction is patented.

Exhibits Improved Equipment

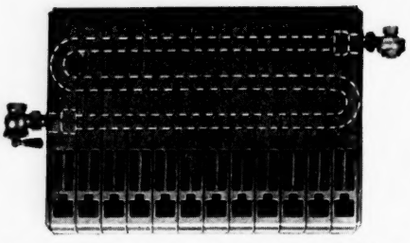
The Spencer Turbine Company, Hartford, Conn., is exhibiting for the first time at the New York Power Show the new Spencer Turbo-Compressors built of copper bearing metal, and a new Heavy Duty Portable Vacuum Cleaner. While the Turbo-Unit does not constitute a change in design or materially extend the life of the unit under normal conditions of atmosphere and operation, the use of copper bearing metal does extend the life of service of units placed in service under severe conditions, it is claimed, both as to exterior air and air passage through the machine. This metal is now standard for all sizes. For cases where special chemical action is present, Spencer turbos may be furnished in non-corrosive alloy steels as desired.

The Spencer Heavy Duty Portable Vacuum Cleaner is said to be a distinct innovation in several features—giving more powerful suction than heretofore obtainable in the same weight equipment. The unit is balanced and provided with large wheels that make it easily portable over floor surfaces and stairways. The Vacuum Producer is operated by a ¾ H. P. Horizontal Universal type motor 25 to 60 cycle A. C. and 110 or 220 volts D. C.

The Spencer Vacuum Producer, as used in the Spencer Central Cleaning System, is also exhibited at the show.

Jackson Electric Back Fill Tamper

The Electric Tamper & Equipment Company, Ludington, Mich., recently developed a backfill tamper, incorporating in its design the basic operative principles of the Jackson Electric Hammer Blow Tie Tamper, a railway maintenance tool that has had extensive use. The new tamper is adapted to compacting fill in trenches and behind retaining walls and abutments, handling dry and saturated material with equal facility, it is claimed. When fitted with the proper tool, it may also be used for excavating clay or shale, demolishing brick pavement and vibrating concrete on bridge decks or on similar concrete construction work where a manually operated appliance of this type may be used advantageously.



Supplies Both Convected and Radiated Heat

Shaw Radiator

The Shaw-Perkins Manufacturing Company, Pittsburgh, Pa., recently introduced a new radiator, known as the Shaw Radiator—a unit of new and distinctive type which combines utility and beauty to a high degree. It comprises an extended surface steel structure in contact with an internal copper tube, all surfaces, including the exterior, being joined in heat contact with the copper tube by an ingenious method which provides a highly efficient and indestructible heat conducting contact. The steel extended surface conducts heat from the copper tube, which contains the heating medium, and gives it off, by convection, to the air which circulates through and over the radiator and also, by radiation, from exterior surfaces. This radiator, therefore, supplies both convected heat and radiated heat and forms its own cabinet, grille and radiator, all in a single unit.

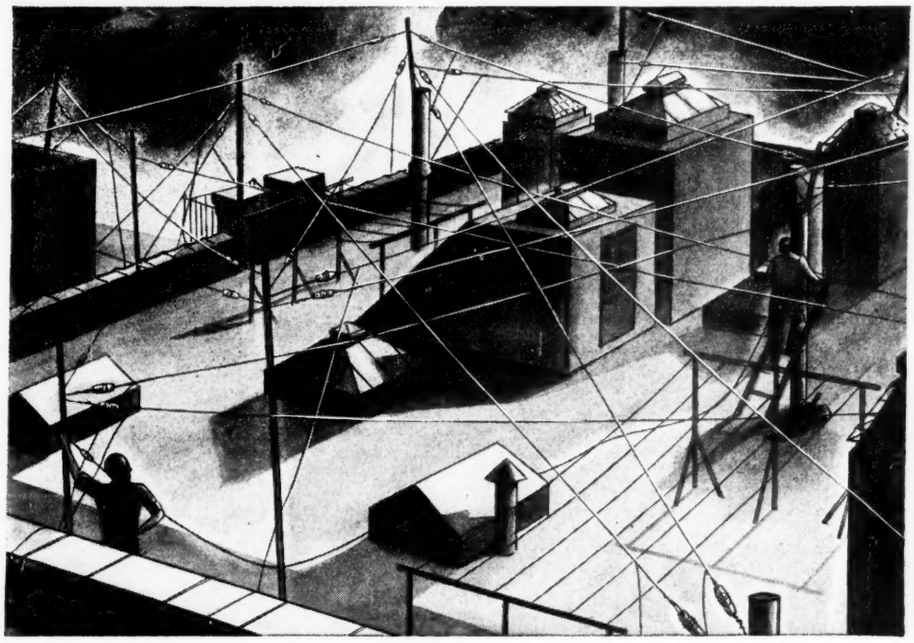
"Crescent" Hydraulic Scraper and Dragscraper

Designed for use behind a tractor on hard digging, the Sauerman "Crescent" Hydraulic Scraper has been introduced by Sauerman Brothers, Inc., Chicago. The curved design gives the wearing blade a continuous plow-share action, so that the bucket digs its own load without plowing or other preparation, and at the same time permits the use of a relatively large bucket for a given line-pull. The unique construction of the bucket also gives it an automatic regulation of the depth of its cut, varying with the hardness of the soil, a feature that reduces the line-pull required to load the scraper. These new hydraulic scrapers are available in various sizes for operation with tractors of all sizes and manufacture.

Engineers of the Sauerman organization have also developed the "Crescent" type of drag scraper, combining great strength with light weight. The mechanical effect of the curved plate design permits construction of the scrapers in large sizes without the use of heavy reinforcements. This scraper is said to carry out still further the principle of eliminating dead weight—a 12-cubic yard bucket actually weighing less than a 10-cubic yard standard "Crescent." The new "Crescent" is of welded construction with a cast steel bail and lip end castings of heat treated alloy steel, providing great strength and resistance to crystallization. Tapered tooth sockets are cast integral with the lip and renewable points fitted into these sockets, each tooth being held in place by a single bolt. Several of the 12-cubic yard "Crescents" were recently installed on tower machines at work on Mississippi River levee construction, and are said to have given excellent results.

Curved Design Gives Blade Continuous Plow-Share Action

America comes out of the ROOF-TOP JUNGLE!



Up-to-date apartment house owners are showing the way out. They are using a new Western Electric product — the Radio Frequency Distribution System. As a result tenants are getting improved reception and a new kind of service. ¶ With this apparatus, every set owner has his own lead-in to one central antenna. He gets any station any time without cross-talk or other interference. No longer need he put up his own outside aerial or be satisfied with inferior results from an indoor antenna. ¶ The equipment serves hotels and other types of multi-family building, as well as apartments. And Western Electric's experience of 50 years in manufacturing telephones for the Bell System counts heavily in the making of such related equipment as the Radio Frequency Distribution System. Get further details of this new development from its distributors, **Graybar Electric Company, Graybar Building, New York, N. Y.**

Western Electric

LEADERS IN SOUND TRANSMISSION APPARATUS

INDUSTRIAL NEWS

Express Rates Reduced

Sweeping reduction in rates recently announced by the Southeastern Express Company is causing considerable interest among the shippers and receivers in the area served by that company. The new low rates will apply on over 300 different items, including merchandise, perishables, textile products, and many other commodities and will closely follow existing railroad less than carload freight rates. This means that fast passenger train express service, including pick-up and delivery service, is now available for freight traffic in this section at a minimum charge. Confidence is expressed by officials of the Southeastern that the reduced rates will be received favorably by the shipping public and that the move will result in the rail carriers reclaiming a material volume of traffic.

"We do not, of course," states C. B. Williams, traffic manager, "claim that express service is the one and only method of transportation, but we do insist that it occupies a definite and distinct place in modern business that cannot be filled in any other way. An express company actually acts as trusted agent for the shipper, collecting, receiving and delivering merchandise from the shipper's door, speeding this to its destination, collecting money on C. O. D.'s, and returning this money to the shipper in as little as 24 hours' time.

"Such dependable service is the result of experience and thought developed over a period of 100 years, and we can say with assurance that never has express service been on a higher standard of all round efficiency and dependability than right now."

The Southeastern Express Company operates on the lines of the Southern Railway System and affiliated lines in the Southeast and supplies pick-up and delivery service at practically all points served by it.

New Gardner-Denver Agency

The Gardner-Denver Company, Quincy, Ill., announces the appointment of Southern Machinery & Supply Company, Roanoke, Va., as agent for its complete line of rock drills and accessories, portable and stationary air compressors, steam and power pumps.

Falk Appointments Announced

The Falk Corporation, Milwaukee, Wis., announces the appointment of G. J. Sturmfelsz as representative in the Baltimore district, with offices at 1620 East 32nd street, Baltimore. It also announces the appointment of H. Douglas Stier as representative in the Atlanta territory, with offices at 101 Marietta street, Atlanta, Ga. This corporation manufactures Falk speed reducers, Falk flexible couplings, Falk Motoreducers and other power transmission equipment, having pioneered in the application of herringbone and helical gears to industry. Its newest product is a line of Motoreducers, which provides a straight line drive and allows a compact combination of both reducer and motor in a single mounting.

Reference Directory for Architect and Builders

An idea conceived by Flippen Burge, well known architect of Atlanta, Ga., has taken the form of a ready-reference directory for the use of architects, builders, engineers and others identified with the construction industry. It is designed to aid those in the building field to speedily locate local representatives of desired building materials and equipment. The directory is entitled "Who Handles" and is published by the National "Who Handles" Building Products Directory Company, 101 Marietta street, Atlanta. As now conceived, "Who Handles" would be published each year in representive cities throughout the country, with well known local architects actively in charge.

At this time the directory is in process of publication in the following cities: Detroit and Grand Rapids, Mich.; Richmond, Va.; Louisville, Ky.; Dallas, Tex.; St. Louis and Kansas City, Mo.; Washington, D. C.; Cincinnati and Cleveland, Ohio; Baltimore, Md.; Indianapolis, Ind.; Chicago, Ill.; New Orleans, La.; Los Angeles, Cal., and New York, N. Y. Publication will soon begin in Pittsburgh, Pa., and Seattle, Wash., while the following cities have been contracted for: Houston, Tex.; Omaha, Neb.; Memphis, Tenn.; Denver, Col.; Tulsa, Okla., and Portland, Ore. "Who Handles" was published in Nashville, Tenn., and Atlanta in 1932, with the 1933 edition scheduled for publication in April for Atlanta and in June for Nashville.

(*Continued on page 54*)

TRIALS AND TRIBULATIONS

Are among the missing when you use ALPHA CEMENT. It is the result of over 41 years of experience in cement manufacture. Distinctive engineering undertakings are a silent tribute to its high quality.

ALPHA PORTLAND CEMENT COMPANY

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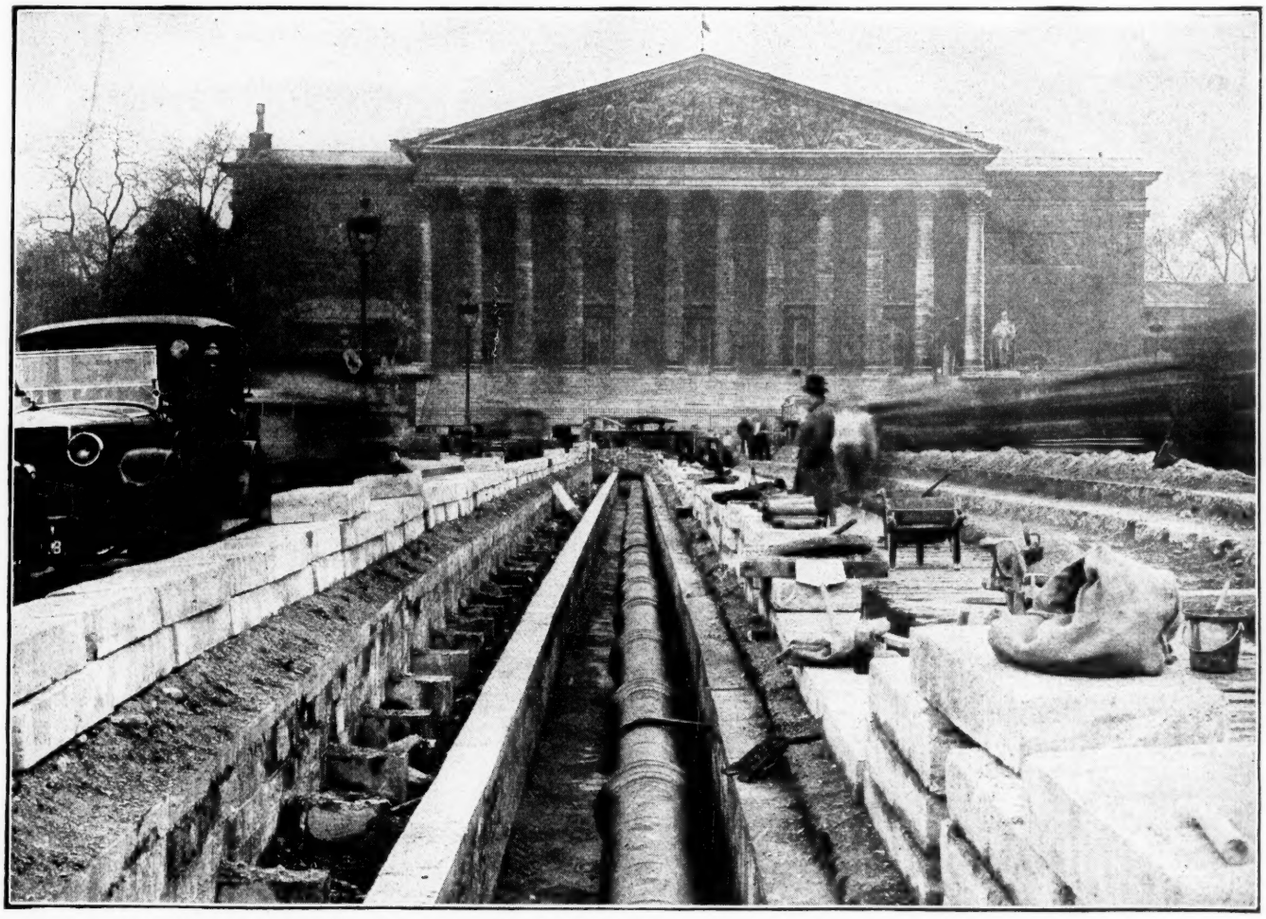
IRONTON, OHIO NEW YORK PHILADELPHIA PITTSBURGH ST. LOUIS

Cast Iron Mains
are tax-savers the world over



Cast iron pipe 106 years old relaid in Paris. Chamber of Deputies in background

THE unretouched photograph reproduced above shows cast iron pipe, more than a century old, being relaid across the Pont de la Concorde in Paris. This famous bridge spans the Seine from the Place de la Concorde to the Chamber of Deputies. The pipe was laid about 1825 and, after serving for more than a century, was taken up and relaid intact in 1931. Every pipe was in sufficiently good condition to be immediately relaid, and the rest of the original pipe line to which this section belonged is still in active service.

Cast iron mains are tax-savers the world over. In Paris, London, Philadelphia, St. Louis and other American cities, cast iron mains that were laid over 100 years ago are still in service, having saved francs and pounds and dollars for millions of taxpayers.

By installing needed cast iron water mains now, your city can save money, relieve unemployment and help to revive business. Taxes need not be increased because water departments, with few exceptions, are self-supporting and profitable. Future taxes can actually be lowered by taking advantage of today's temporarily depressed costs of material and labor for water works construction. Do your bit in a national emergency by advocating such self-sustaining public construction as water works extensions and improvements.

The reason for the long life of cast iron pipe is its effective resistance to rust. Cast iron is the one ferrous metal for water and gas mains, and for sewer construction, that will not disintegrate from rust. This characteristic makes cast iron pipe the most practicable for underground mains since rust will not destroy it.

• • •

For further information, write to The Cast Iron Pipe Research Association, Thomas F. Wolfe, Research Engineer, 122 South Michigan Ave., Chicago, Ill.

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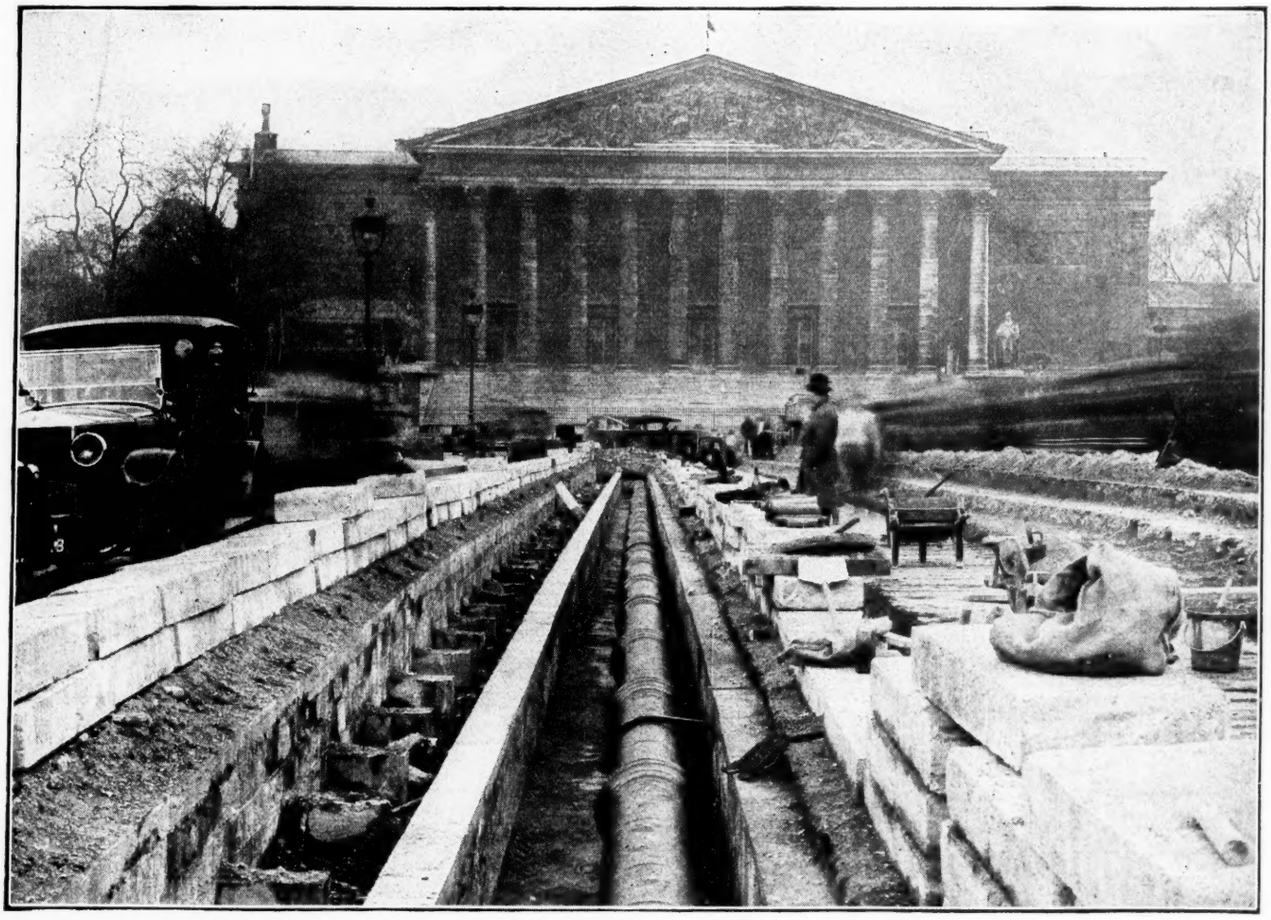

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(*Continued from page 52*)

Link-Belt Birmingham Representative

The Link-Belt Company, Chicago, announces the appointment of the Moore-Handley Hardware Company, 25 South 20th street, Birmingham, Ala., as distributors and direct representatives in the Birmingham district for the complete line of Link-Belt elevating, conveying and power transmitting machinery. In this capacity, the Birmingham company, which recently celebrated its 50th anniversary, will give engineering assistance in the solution of conveying and power transmitting problems, and will carry a suitable stock of Link-Belt chains, gears, sprockets, transmission machinery and screw conveyor including complete Silent Chain and "RC" Roller Chain drives.

Whitcomb Locomotive Acquires Milwaukee Company

The Whitcomb Locomotive Company, Rochelle, Ill., subsidiary of the Baldwin Locomotive Works, announces the acquisition, as of July 19, of the Milwaukee Locomotive Manufacturing Company, under a plan whereby Westinghouse Air Brake Company, former owner of Milwaukee Locomotive Manufacturing Company, becomes a stockholder in the Whitcomb Locomotive Company. Milwaukee internal combustion locomotives range from 4 to 20 tons, all powered with gasoline engines and all equipped with mechanical transmission.

Surface Condensers.—Ingersoll-Rand Company, New York, has issued a new bulletin, Form 9227, on Surface Condensers, illustrating and describing many of the company's condenser installations, ranging from small units up to those of 160,000 kw. capacity.

De Laval Propeller Pumps.—Propeller pumps—axial flow pumps for handling relatively large volumes of liquid against comparatively low heads at high rotative speeds—are described and illustrated in Catalog B-6 issued by the De Laval Steam Turbine Company, Trenton, N. J. These pumps are adapted for circulating condenser cooling water, lifting storm water in drainage and sewage systems irrigation service and for practically all purposes within the head limitations.

Excavating Equipment.—The Bucyrus-Erie Company, South Milwaukee, Wis., has issued a bulletin illustrating and describing its new 16-B, ½-yard shovel dragline, crane, clamshell, dragshovel, skimmer scoop—a small and speedy machine, in which many new developments have been introduced to make possible the low cost output required in present day excavation and material handling. Copies of the bulletin may be obtained from the company upon request.

Low Cost Automatic Heat.—The Detroit Stoker Company, Detroit, Mich., has issued a new catalog devoted to Detroit LoStokers, the use of which is described as "the most economical method of producing heat." The publication is generously illustrated for showing the design, operation and application of these stokes and pointing out economies obtainable with them.

Steam Traps.—The Armstrong Machine Works, Three Rivers, Mich., is issuing a new manual on steam trap engineering. Described as a most complete treatise on this phase of steam engineering, the book is designed to be especially useful in aiding the selection of the proper steam trap for cooking kettles, ironing and pressing machines, evaporating pans, separators, laundry machines, paper driers, oil refinery equipment, unit heaters, water heaters, greenhouse radiation, sterilizers, steam engines, rubber vulcanizers, textile machines, etc.

Type E Stoker-Unit.—The Combustion Engineering Corporation, New York City, is distributing a pamphlet illustrating and describing the Type E Stoker-Unit, a new stoker recently developed by the corporation for application to boilers in the approximate range of 40 to 150 developed boiler horsepower.

Andrew Ingraham Creamer, widely known resort hotel operator, died November 29 after an illness of several months at his home in Damariscotta, Maine. He was 59 years of age.

A native of Bremen, Maine, for the past 40 years he was identified in the management of resort hotels in the White Mountains of New Hampshire, the Great Lakes region of northern Michigan, and in Florida and North Carolina. For 26 summers he was managing director of The Inn at Charlevoix, Michigan, and was at the Holly Inn, Pinehurst, North Carolina, in a like capacity for a number of winters. The high spot of his career came in the building of the Highland Pines Inn, Southern Pines, North Carolina, in 1912 of which he was senior partner for 20 years.

Surviving besides the widow, Mrs. Lillian Wilson Creamer, is his mother, Mrs. Angelia F. Creamer, and a brother, Alton M. Creamer of Waldoboro, Maine.

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The uniform high quality of our treated timber gives lifetime satisfaction . . . and low yearly average cost.

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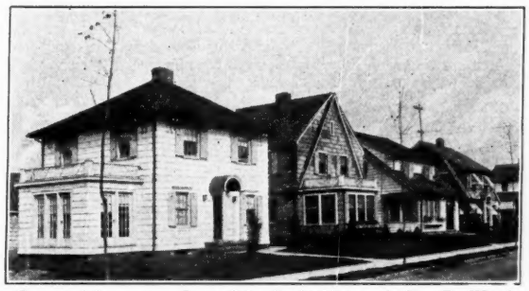

Group of houses on Long Island, Architect, Arthur B. Wood, Garden City, L. I. All shingles stained with Cabot's Creosote Shingle and Wood Stains.

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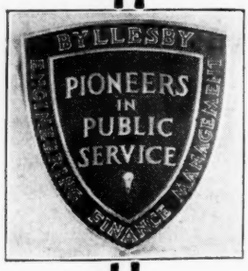

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TEXTILE NOTES

Textile Leaders Reaffirm Position on Night Work and Shorter Work Week

Another warning to the textile industry against overproduction following the increased demand of recent months has been issued, and this time by leaders of the industry comprising the Board of Directors of the Cotton Textile Institute. At a recent meeting in Spartanburg a further plea was made for cooperation of all manufacturers by 85 textile mill executives representing 175 mills operating about 50 per cent of the spindles in the United States. Elimination of night work for women and minors and advocacy of the short work week were covered in the following resolution:

"First, resolved that the Board of Directors of the Cotton Textile Institute reaffirms its belief in the wisdom of the policy regarding the elimination of night employment of women and minors, and resolved, further, that the form of cooperation with respect to this matter be decentralized by referring such policy to the several manufacturing groups, comprising the cotton industry, for group consideration, administration, and individual voluntary acceptance.

"Second, resolved, that the Board of Directors of the Cotton Textile Institute reaffirms its belief in the wisdom of the shorter work week recommendation commonly known in the industry as the '55-50' policy, which has had the approval and support of a great majority of the cotton mills in the United States."

The movement should have the active support of all manufacturers or the betterment experienced by the industry following the increased demand for cotton goods will be jeopardized as the result of over-production. Individual pledges are sought from every member of the Textile Institute and it is hoped that independent manufacturers will cooperate with the majority in helping to stabilize conditions. A few independents who are not willing to abide by the majority in controlling production to demand can undermine the entire industry.

Net Weight Cotton Contract for Cotton Covered Bales

The International Federation of Master Cotton Spinners' and Manufacturers' Association, Manchester, England, has submitted a resolution favoring the adoption of a net weight cotton contract for cotton covered bales to all the cotton exchanges in the world dealing with American cotton.

The resolution was adopted last February and has since been confirmed by 20 of the 21 affiliated associations in as many countries, states N. S. Pearse, general secretary.

It was felt that the adoption of a net weight cotton contract for cotton covered bales would stimulate the use of cotton material instead of jute for the covering of cotton bales, with the ultimate elimination of jute fibers from the raw stock. Mr. Pearse points out that this would be the chief advantage of the adoption of cotton covered bales to the spinners, and ginners and growers should not be misled into believing that the resolution was adopted with the main object of increasing the consumption of cotton. The presence of jute fibers in the raw cotton is a matter of great inconvenience both to the cotton mill operative and the mill manager, as each little jute fiber which becomes entangled with the cotton causes breakage in the yarn during the spinning process.

Production and Stocks of Cotton Goods

Continuation of high production and low mill stocks featured the October report of the Association of Cotton Textile Merchants of New York. Production during October was 253,109,000 yards, or at the rate of 63,277,000 yards weekly. This was an increase of 11 per cent over the weekly rate for September. Billings were 246,562,000 yards, or 97.4 per cent

of production. Stocks on October 31 were 166,668,000 yards, 6,547,000 yards above the lowest figure for any month which was recorded in September. Sales were 149,657,000 yards and unfilled orders 347,123,000 yards.

New Figure in Southern Textiles

It is announced in the reorganization of the Hunter Manufacturing and Commission Company, Greensboro, N. C., perhaps the largest cotton goods selling agency in the United States, that Howard E. Coffin is heading the new company. A nationally known industrialist is thus brought into the Southern textile field. Mr. Coffin, a director in many corporations, has a high reputation as an engineer and industrial leader. In a speech some weeks ago before the Cotton Textile Institute he showed a sound grasp of the situation confronting the cotton manufacturer and urged that through cooperative action production be balanced to demand, and warned against following suicidal policies of cut-throat competition which forced prices below production costs.

World Cotton Crop

The world cotton crop this year is estimated at 23,400,000 bales, the smallest since 1923-24. Decreased production in the United States accounts for most of the reduction from last year's 27,140,000 bale crop. The Egyptian crop was one-third less, and minor decreases are reported from Brazil and Mexico. India, China and Russia increased production.

American Cotton Exports

For the first quarter of the current cotton season, or from August 1 to November 1, Europe has taken 23 per cent more cotton than during the corresponding period of 1931. The increase was more than sufficient to off-set the decline in shipments to China and Japan which were not expected to continue at the high rate of early summer. Raw cotton exports for the first quarter amounted to 2,194,000 bales valued at $89,613,000, a gain of 411,000 bales and $16,695,000 in value over the same three months of 1931.

United States exports of cotton yarns increased from 10,954,000 pounds in the first nine months of 1931, to 12,075,000 pounds in the corresponding period of this year, while the value, reflecting lower prices, declined from $5,070,000 to $3,581,000, according to the Department of Commerce.

Over-Production and Price Cutting

Cautioning the manufacturers of the South against the devastating effect of the lack of merchandising courage in controlling production and maintaining prices, K. P. Lewis, president of the Erwin Cotton Mills Company, Durham, N. C., and president of the North Carolina Cotton Manufacturers Association, said in a recent address:

> "It seems to me that the managers of the cotton mills of the South have been sadly lacking during the last few months in appreciation of their opportunities and it seems particularly distressing that they are not grasping the opportunity of profit on their operations at a time when the opportunity has been right at hand. I appeal to you not to get panic stricken by the dullness of demand into pushing your goods on an unwilling market at decreased prices. Just a little courage and merchandising judgment will save the cotton mills of the South millions of dollars during the next year.
>
> "This question of the proper merchandising of our products carries with it the sensible regulation of our production. Would it not be vastly better for all of us, instead of trying to break records as to the number of days run or the number of nights operated, to commence to look at the situation from the standpoint of the stockholder and so regulate our stocks that the buyers of dry goods may not soon have forced upon them the knowledge that we have burdensome stocks that we are ready to give away? Surely the time has come when our stockholders should have evidence of better judgment and wiser action on our part."

THE CUTLER MAIL CHUTE

TO INSURE standard, dependable equipment installed promptly at moderate cost, the Cutler Mail Chute should be specified by name. If desired, approximate estimates will be furnished in advance.

If preferred, a stated sum may be allowed to cover this item.

Full information, details, specifications and estimates on request.

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General Offices and Factory
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Development of Shannon & Luchs Construction Co., at Washington, D. C. Outside walls of houses finished with shingles stained with Cabot's Creosote Shingle and Wood Stains.

For Economical Renewal

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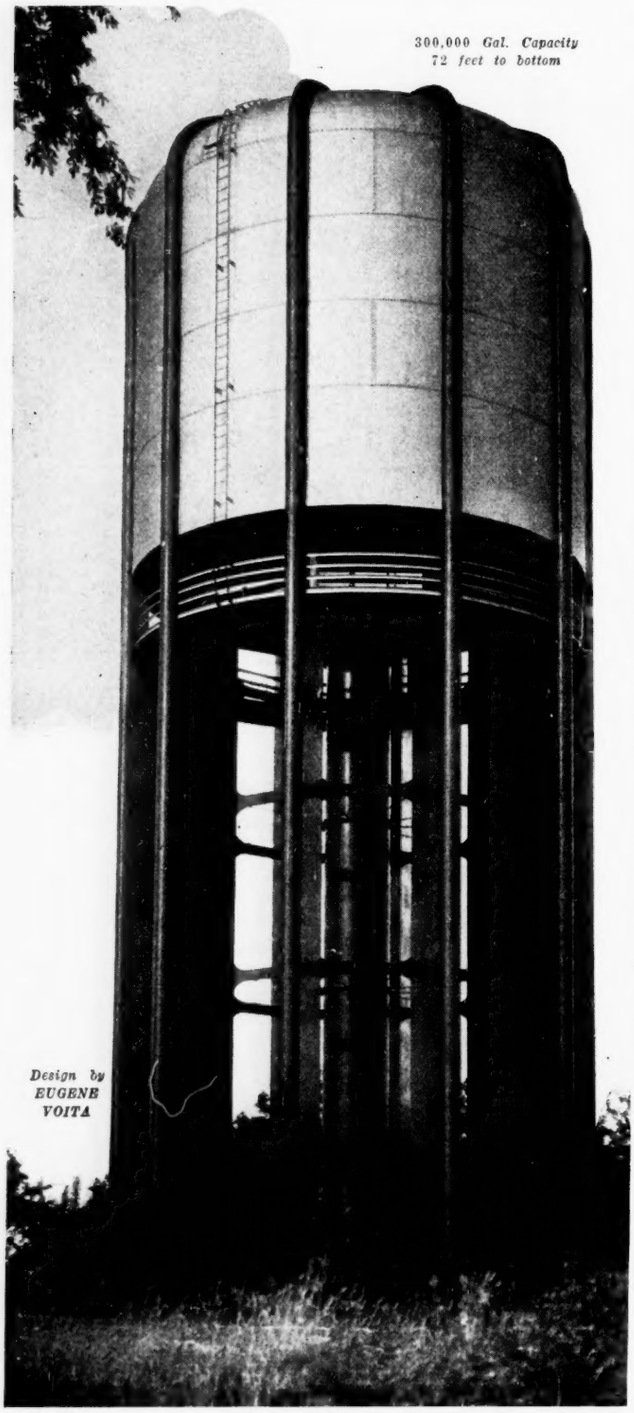

THIS FIRST PRIZE DESIGN tank has been built for the City of Baltimore at Towson, Md. Other municipalities are invited to take advantage of the designs submitted in the competition which we sponsored to "Develop a general aesthetic improvement in the character of elevated steel water tanks."

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ITEMS OF INTEREST

THE NATIONAL ASSOCIATION OF MANUFACTURERS, at its meeting in November, went on record as opposed to general Congressional revision of the tariff. It expressed its advocacy of the Tariff Commission as the proper form of administration.

> The report of the Committee of the Association stated: "The spread of profits on imported articles sold in the United States runs anywhere from 100 per cent to 3000 per cent. * * * 103 articles imported into this country were sold at an average profit of more than 300 per cent above the landed cost, while some of the individual articles were sold at profits as high as 3325 per cent above the landed cost.

PHOTO ELECTRIC CONTROL of lighting, according to an announcement by Westinghouse, saves in one industry 4000 kilowatt hours monthly and reduces lamp replacements by one-fourth.

By having a photo tube directly gauge the intensity of daylight, the lights in the plant are automatically turned on in cloudy weather and later extinguished when daylight returns to normal intensity.

AUTOMOBILE MANUFACTURERS usually do things in a large way. One company recently announced in producing their new car it would take 50,000 units to stock their dealers for the initial showing and an investment of $20,000,000 for this one item. Another announced they would place orders for materials and supplies aggregating $42,000,000.

THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION, in carrying out its excellent plan of making annual awards for the most beautiful bridges erected in the country, selected a bridge at Bucksport, Maine, as the most beautiful bridge of medium size erected during the past year.

President Charles N. Fitts, in announcing the award, at the same time presented, on behalf of the Institute, two stainless steel plaques in commemoration of the event. The plaques are decorated and will be preserved in their original beauty by a new process perfected by the General Alloys Company. It is known as KloiZenay, a colorless glass poured on the stainless steel casting, so that the silica of the glass fuses with the metal. Stainless steel is heated to 2400 degrees Fahrenheit, so it is plastic when the glass is poured on its surface. It is possible in this way to obtain a general background of a rich royal blue for the lettering, while the seal of the Institute, which appears on it, has a center background of red with a border background of black. The colored glass of the background is said to be immune to cracking or crazing and the colors are rendered permanent.

THE PRESS carries an item that five-room cottages are being built of copper in Germany and the same metal is being used for frames in walls of larger buildings.

DR. C. A. BASORE, professor of chemical engineering, Alabama Polytechnic Institute, Auburn, is reported as having perfected a development for the manufacture of glass from blast furnace slag. This is a new use for a product that has already been found valuable for road building, certain forms of concrete work and for brick manufacture.

THE AMERICAN MINING CONGRESS is to hold its 35th annual meeting in Washington on December 15-17. Subjects to be discussed include: Future market for minerals, stabilization of copper, coal, lead, zinc and oil industries, as well as the modernization and use of new materials in mining operations.

AT THE POWER SHOW in New York this month is exhibited a motor which is said to draw its power from the surrounding atmosphere. In calling attention to it, the Cochrane Corporation of Philadelphia, specialists in steam power plant equipment, state that it is a thermodynamic device and operates continuously on a temperature head, which is generally available. The company announced that it is not put forward as a rival of steam turbines, internal combustion engines or water wheels, and no stock is offered for sale. The purpose of the exhibit is "to direct thought to the fact that there are unsuspected scientific possibilities lying all about and awaiting study by inventors and development by progressive industrialists."

THE NATIONAL INDUSTRIAL CONFERENCE BOARD has called attention to the fact that a man who buys crude rubber in the New York market this year gets for his dollar almost nine times the quantity of rubber he could have bought with the same dollar in 1923, but the seller of the rubber receives only 11 cents as compared with $1.00 in 1923.

The Conference Board has published a chart showing the changes in prices in 20 other commodities, but the above is the extreme case.

MANUFACTURERS of the United States are giving more and more attention to the value and importance of South American markets. Our Southern states have a particular interest in this because of their geographical advantages over plants located in sections of the country that are farther removed. In any development of this kind, the ports of the South Atlantic and Gulf Coasts will show increasing benefits, because through these gateways will come the raw materials from our Southern neighbors destined for the factories of not only the South, but the North and Middle West.

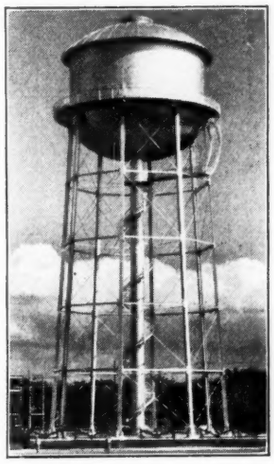
THE GENERAL ELECTRIC CO. recently announced receipt of the largest shipment of mercury ever made. It was intended for use in a new 20,000 kilowatt mercury turbine they installed at a public service plant in New Jersey. The shipment consisted of 270,000 pounds. There will be a shipment of equal amount delivered later for another mercury turbine plant being built in Schenectady. This is almost as much mercury as the United States buys in an average year.

THE DEPARTMENT OF AGRICULTURE estimates that approximately 1,500,000 more people have gone back to the country than have moved to cities from the country during the depression. It is surprising that the number is not more, for despite the difficulty of the farmer to obtain a proper figure for his products, he at least is able to obtain food and shelter for his family, and in contrast with the lot of the unemployed in our great cities, his state is greatly to be preferred. This exodus will not add to agricultural overproduction, because these men are looking for a chance to feed themselves first and are no doubt not experts in quantity output.

Our idea of life and the essentials for happiness are changing as time moves on. The farmer, notwithstanding the pity lavished upon him by the politicians, has many things in his favor that make for independence and happiness.

Nothing is more important, however, to agricultural success than industrial development. The decentralization of industry, about which this publication has talked many times, will do more to promote the prosperity of the farmer than anything else that could be undertaken. A proper market for farm products depends upon industrialized communities close at hand, and as the MANUFACTURERS RECORD has pointed out repeatedly, life in these smaller communities is independent to a large extent of the forces that too often make for gloom in the great cities.

COLE



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FINANCIAL NEWS

Christmas Club Benefits

The Christmas Club points out that $440,000,000 will be distributed to 10,500,000 people this year as their savings in various Christmas Clubs throughout the country. The average amount to be received by each member will be $42, and while it represents a reduction of 11 per cent compared to a year ago, the buying power of the dollar has increased more than enough to make up the difference.

The distribution of such a huge sum of money should provide an important impetus to business. Bankers predict an increase in Christmas Club membership in 1933.

The largest distributor of these Christmas funds is the Bank of America National Trust & Savings Association through its 395 branches in California, which has about $5,000,000 to pass out to members.

Marking Down Capital Assets

Finance students agree that general writing down of company assets will become, to an increasing extent, a part of the new order of things. The security market, it is believed, has very probably discounted such changes and as business progresses the natural effect will be to make a better net financial showing for corporations which have been put to it to show any earnings at all. Stockholders of companies are more and more coming to the conclusion that it is better to face facts instead of fooling themselves with ideas of values that were reached only during boom times.

Home Loan Bank Activities

It will be of interest not only to the financial world, but to the business world, to be informed when the great good expected to be accomplished and which no doubt will be accomplished by the Federal Home Loan Banks is actively under way. President Ward B. Whitlock of the U. S. Building and Loan League, estimates that 75 per cent of existing homes are out of date and need improvements. "The money which home loan banks will supply to building and loan associations will provide financing facilities to start home modernizing on the great scale which is needed." He figures that an average of 50 per cent for all home repairs goes to the purses of the workmen, and on this basis, something like $100,000,000 could be paid out in wages as soon as financing is available to meet the demands for twice that amount needed for modernization. Assuredly a desirable movement to get actively started.

Relief For Farmers

The list of the agencies set up for the relief of the farmer is a large one. A news summary recently carried the statement that in addition to the money totaling $515,000,000, which came out of the Reconstruction Finance Corporation act, other vast sums to be counted include:

$380,000,000 allocated to the Secretary of Agriculture as a part of the Treasury's subscription to stock and debentures of the Reconstruction Finance Corporation.

$125,000,000 subscription by the Treasury Department this year to Federal Land Bank stock.

Besides this, there were:

12 Federal Land Banks lending money on farm mortgages.

12 Federal Intermediate Credit Banks for handling agricultural paper.

12 Regional Agricultural Credit Corporations lending on farm produce.

Then there is the Federal Farm Loan Board with its

(*Continued on page* 62)

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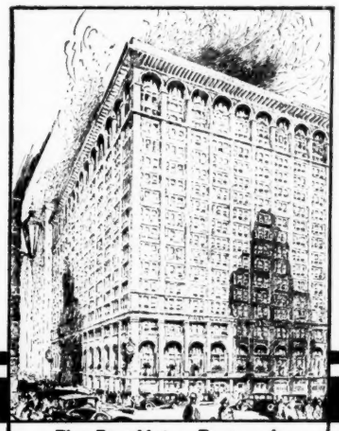

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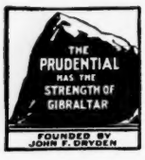

HAND TO YOUR SECRETARY

Please write on my letterhead to Group Pension Department, The Prudential Insurance Company, Newark, N. J. Ask them to send a copy of "A Little Book about Pensions."

(Continued from page 60)

capital and its purchases through its subsidiary organizations of millions of bushels of wheat, and a million bales of cotton that were taken from the market.

It is said that the loans of the Federal Land Banks on mortgages have reached a total of nearly $1,300,000,000.

Loan Requests Diminishing

A request of the Reconstruction Finance Corporation for additional opportunities for lending money on well secured projects, is met with the reply that the rules are too stringent and should be changed to meet conditions which, in many localities, will give a wider market for the Corporation's funds and be more in keeping with the intent of the law by which the Reconstruction Finance Corporation was established, i. e., to have the relief, embodied in the idea, spread generally throughout the country. This will probably be brought up in Congress and the desirability discussed of adopting regulatory measures that will open the door a little wider.

Postal Savings

Postal savings in October reached the highest peak yet attained since the inauguration by the government of this plan of receiving deposits from the people. The increase in the month was nearly $10,000,000 over the amount for the previous month, and September this year showed total deposits of over $854,000,000, which was $46,000,000 more than the total postal deposits at the end of September 1931.

The Investment Market

By all the rules the investment market should respond to the idle funds that are accumulating in large city banks, which has been commented on in various quarters. These increasing reserves usually lead to increasing investment demand, and with money available at extremely low prices it would not be surprising if investments of the safest type came to better recognition than has been the case lately. Money to be profitable must find employment.

Federal Reserve Gold

Federal Reserve Banks are increasing their gold reserves. They are now up to 75 per cent in gold for the $2,925,000,000 currency circulated.

Better Times

It is gratifying to have the opinion of Thomas W. Lamont, one of America's leading bankers, to the effect that "the panic of fear has subsided. * * * manifestly, and with renewed confidence on all sides, men are exerting their best efforts toward construction." There remains the necessity for instilling confidence in the doubtful, persuading buyers who are able to do so to fill their needs and to face courageously the fact that business must proceed from present levels, rather than to wait for something to turn up to bring us to the height of prosperity overnight.

Utility Bonds

Bankers have been studying the market position held by the better grade of utility bonds, and are gratified at the showing they have made. There is reason for this in the fact that operating companies have, to a large extent, retained their earning power, not being affected to anything like the degree other businesses have been affected during the depression. The utility operations fill such a large place in our daily lives, that the management of these enterprises should take a position of leadership in constructive action, looking to the upbuilding of industry generally.

Farm Mortgages $9,000,000,000

Ernst & Ernst, the well-known accountants and auditors, say American farms are mortgaged for more than $9,000,000,000, almost as much as the bonded indebtedness of American railroads. "This huge debt is one basic cause of most farm troubles and of most demands for farm relief."

BUSINESS IMPROVES

Returning confidence in business futures has resulted in the higher evaluation of securities, the strengthening of commodity prices, and an increase in the purchasing power of the American people.

Problems are presented during this period of adjustment which require cooperation, experience, and counsel.

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Municipal Water Works

Information dealing with "Rates, Revenues and Results of Municipal Water Works in the United States" has been assembled from 250 cities and published in booklet form by Burns & McDonnell Engineering Company, Kansas City, Mo. The booklet contains a list of all the municipal and private plants in each state and is said to present statistics never before available. Price of the booklet is $1.00.

Rust Preventative

Recent experimentation by the British National Physical Laboratory, reports the Department of Commerce, has shown lanoline, a waste product of the woolen industry, to be a satisfactory coating for the preservation of bright steel surfaces. Test pieces at the end of three years are said to have shown no signs of rust.

Vitrified Paving Brick

The division of simplified practice of the Bureau of Standards, Washington, reports the revised simplified practice recommendation number 1-32, covering vitrified paving brick, has been "accorded the required degree of acceptance by all interests in the industry." In the revised schedule, prompted by the results of a survey conducted by the standing committees of the industry, the 4x3x8½ inch vertical fiber lug brick has been included, and the 3½x4x8½ inch vertical fiber lugless brick has been eliminated.

Rammed Earth Walls

Construction of a building with walls of rammed earth has been completed by the Bureau of Agricultural Engineering at the Department of Agriculture Experiment Farm in Arlington County, Va. The structure is a one-story addition to the fertilizer machinery building.

The walls are of clay loam subsoil—from a nearby excavation—rammed between forms, and are built in sections 10, 12 and 16 inches thick to determine the most desirable thickness. Concrete footings extend from below frost line to about 12 inches above ground level. Exterior wall surfaces are divided into more than 30 sections, finished and waterproofed in different ways.

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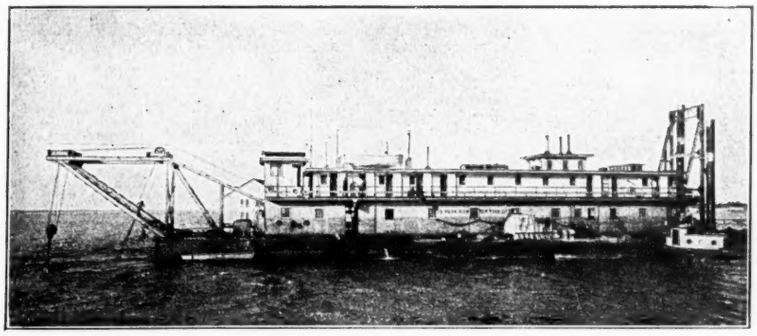

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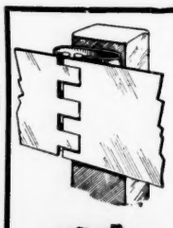

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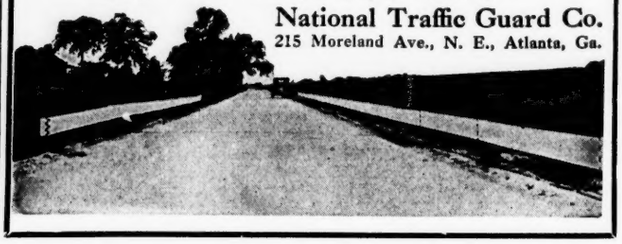

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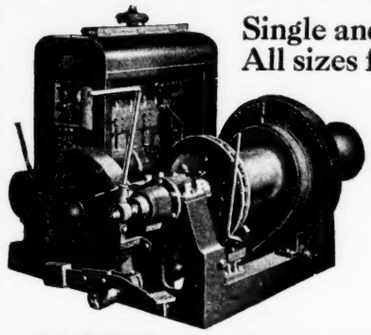

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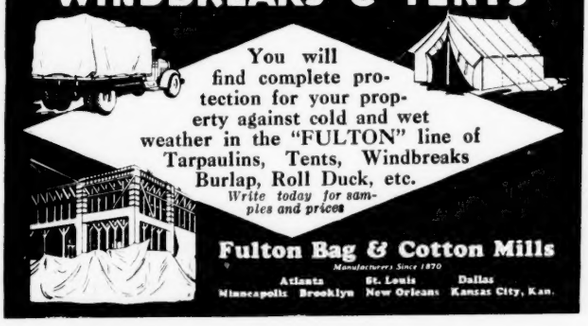

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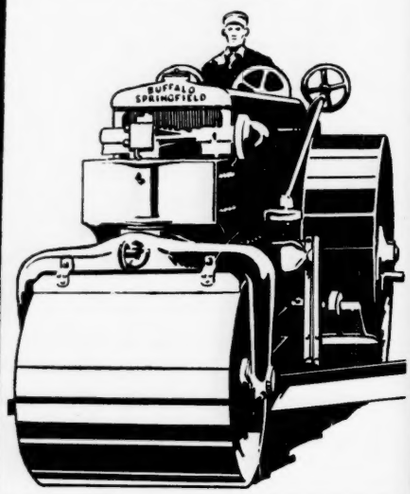

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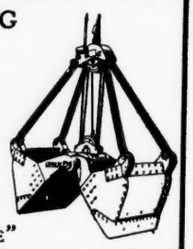

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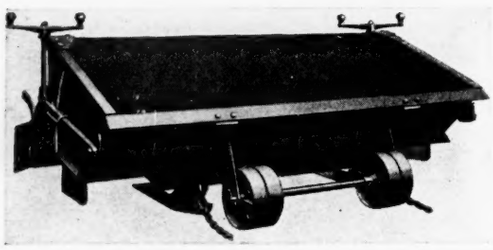

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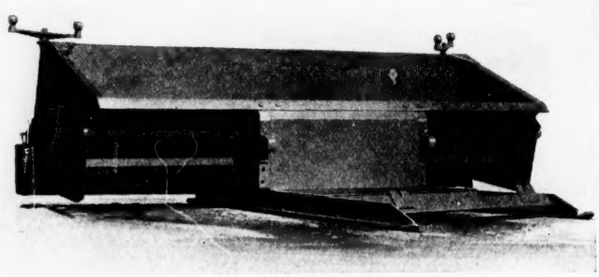

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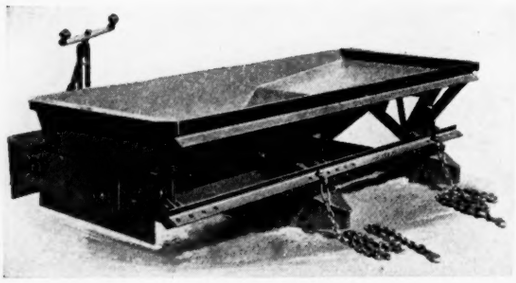

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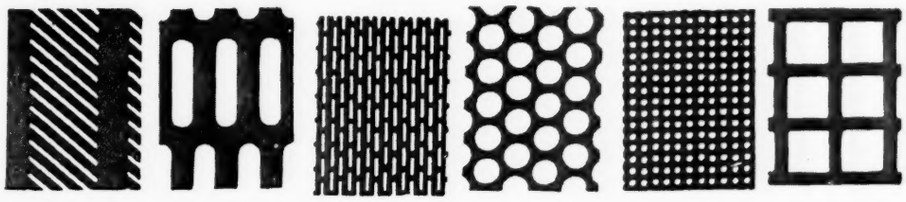

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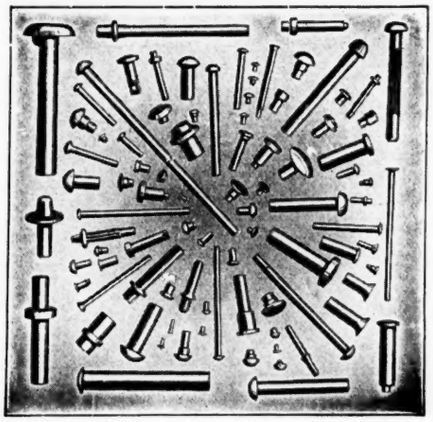

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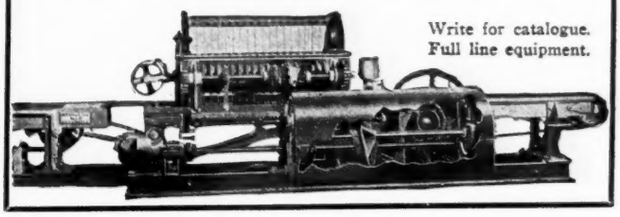

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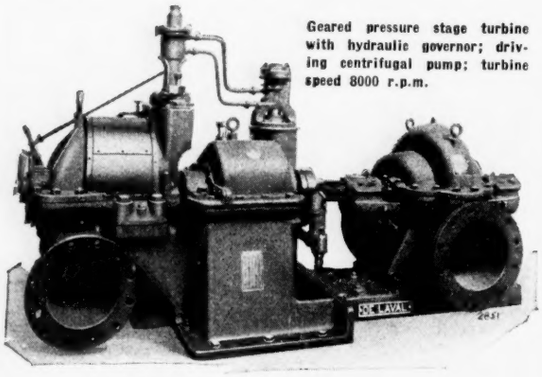

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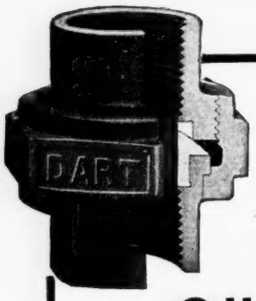

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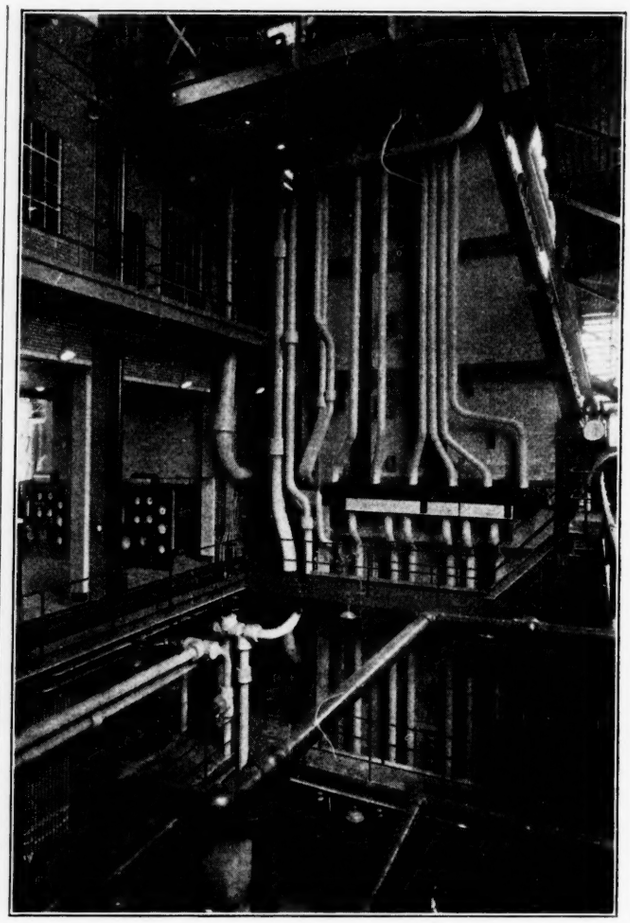

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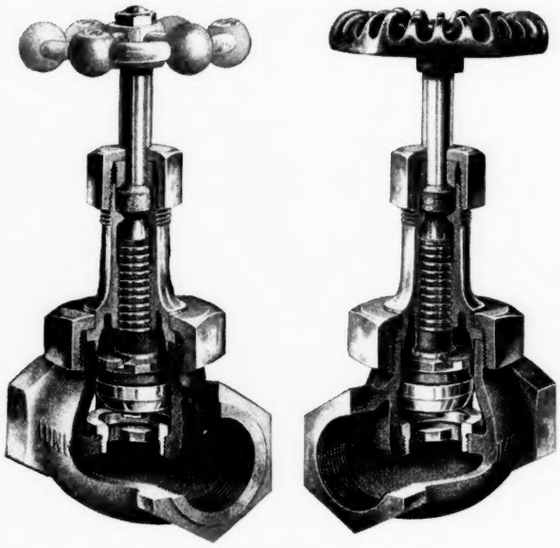

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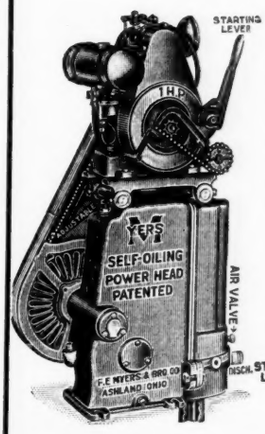

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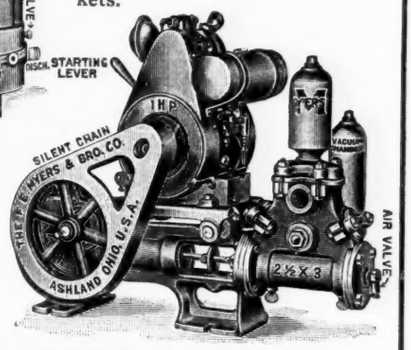

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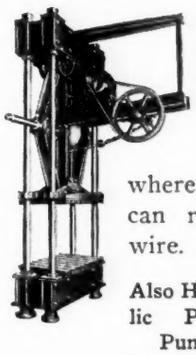

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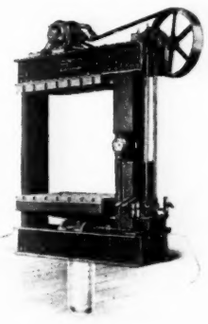

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The Southern Industrial and Highway Review Number

of the

Manufacturers Record

January, 1933

THE South's participation in the major industrial activities of the country, including highway construction and maintenance, will be set forth and interpreted in our January issue, the Southern Industrial and Highway Review Number. The editorial treatment of these subjects and the wealth of facts and figures published will not only command the thoughtful consideration of the business interests of the South as well as the rest of the country but will make this issue a valuable reference for some time to come.

Many major industries have shown a definite advance since midsummer. In many lines the gains from the low point have been more than seasonal, indicating a fundamental change for the better. The South has shown many encouraging signs of being the first part of the country to recover. This section's return to industrial activity and the further development of its vast resources will create a market of great value deserving the careful attention and persistent cultivation of nearly every manufacturer in the land.

The Manufacturers Record has always devoted its every energy to the further progress of Southern industry and reaches a select group of business executives who represent the bulk of the South's buying power. For the past 50 years this paper has been respected and consulted by those interested in the South's industrial growth. To those who wish to share in Southern business, the Manufacturers Record offers an advertising opportunity of exceptional value.

Our forms for the January number will close December 30th.

Manufacturers Record - - - - Baltimore, Md.

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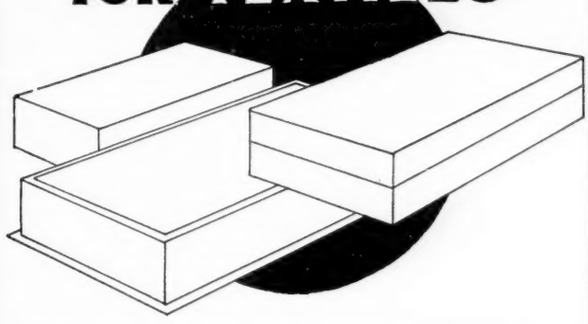

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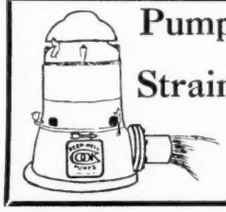

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Government in Business

(*Continued from page 24*)

ers as typical of many received by the Committee are given in the following extracts:

Francis J. O'Donnell, treasurer of the Joseph M. Herman Shoe Co., Boston, testified that the Army received a bid for shoes from the Brown Shoe Company of St. Louis, at $2.44½ per pair and his own company was second low bidder at $2.49 per pair. The Leavenworth Federal Penitentiary's shoe factory quoted $2.73 per pair. The price was contested by the Quartermaster Department and as a result it was decided to allow the Penitentiary $2.59 per pair or 14c above the unit price offered by the Brown Shoe Company, "this in spite of the fact that the law prescribes that the price must not be in excess of the current market prices," declared Mr. O'Donnell.

Edwin B. Pollister, president of the Busch-Sulzer Bros.-Diesel Engine Co., St. Louis, in making a complaint against government competition furnished the following facts to Chairman Shannon:

"During the 7-year period from 1914 to 1920, the Bush-Sulzer Bros.-Diesel Engine Company built for the United States submarines 72 Diesel engines aggregating over 50,000 horsepower. This business amounted to over $7.-000,000.

"By the sudden decision of government officials to enter the submarine Diesel building field, we were then abruptly cut off from this source of business, on which we had come to depend and for which, at considerable expense, we had provided special facilities and an engineering staff highly trained in the specialized work of building this type of Navy Diesel.

"In all fairness to the particular Navy officers who decided to build at the Brooklyn Navy Yard all submarine Diesel engines rather than buy them, I am convinced that they probably did not even stop to consider the economic consequences of their action, or that their decision might destroy a substantial part of our established business, leaving us to carry the burden of continuing obligations of European technical collaboration, incurred, in part, in anticipation of supplying the special requirements of the Navy. Yet, during the war, the Busch-Sulzer plant was placed at the exclusive disposal of the Government for the building of submarine Diesels to the practical exclusion of its commercial Diesel engine business.

"Relief is urged in the prompt discontinuance of all building of Diesel engines by the Navy Department, of all purchases abroad of Diesels, Diesel designs and technical data, and the placing with qualified American builders, of which there are several, of orders covering the development and supplying of suitable sizes and types of Diesel engines for all requirements of Navy submarine and surface ships."

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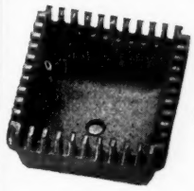

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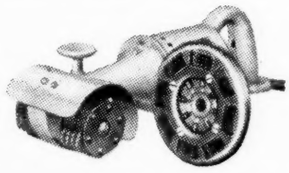

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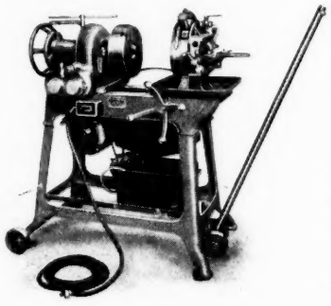

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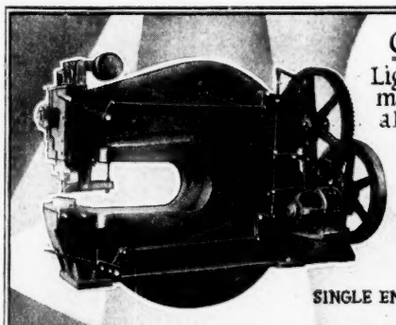

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